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Monthly Message

It is with great pleasure that we welcome Dr. Edward Harvey Cushing as Deputy Assistant Secretary of Defense for Health and Medicine. Dr. Cushing has been an alternate member of my Civilian Advisory Council for the past year and served as Acting Deputy during my five weeks' absence in the Far East last fall. He commenced his official duties on 3 March 1955 and brings to the office a wealth of experience in clinical medicine, research, active duty in both the Army and Navy, and in the knowledge of government medicine.

Dr. Cushing received an A. B. from Yale University in 1919 and an M. D. from Harvard in 1923. Following internships and residencies in the Presbyterian and Bellevue Hospitals in New York and Lakeside Hospital in Cleveland, he entered into the active practice of medicine in the latter city in 1928 and became Associate Clinical Professor of Medicine at Western Reserve. He served in 1916 in the Field Artillery in the Mexican Border Campaign and in World War I; during World War II he served as commander and captain in the Medical Corps, U. S. Naval Reserve from 1940 to 1946, receiving the United States Typhus Commission Medal. From 1946 to 1952 he was Assistant Chief Medical Director of the Veterans Administration in charge of research. He is a member of the American Medical Association, the American College of Physicians, the American Clinical and Climatological Association, and other medical organizations.

Dr. Cushing's association with this office will add much to its potentialities.

Frank B. Berry

FRANK B. BERRY, M. D.
Assistant Secretary of Defense
(Health and Medical)

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Foreword

The *United States Armed Forces Medical Journal* is the medium for disseminating information of administrative and professional interest to all medical personnel of the Department of Defense. The Assistant Secretary of Defense (Health and Medical) and the Surgeons General of the several services invite all medical officers, dental officers, Medical Service Corps officers, Nurse Corps officers, and officers of the Veterinary Corps of the Armed Forces, and the medical consultants of the Army, Navy, and Air Force to submit manuscripts for publication in this *Journal*.

FRANK B. BERRY, M. D.,
Assistant Secretary of Defense (Health and Medical).

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UNITED STATES ARMED FORCES
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THE PROBLEM OF PULMONARY INSUFFICIENCY IN DISABILITY RATING

A Critical Evaluation of the Need for a Physiologic Classification

JAMES C. SYNER, *Captain, MC, USA*
CHARLES S. CHRISTIANSON, *Lieutenant Colonel, MC, USA*

THE QUANTITATIVE evaluation of pulmonary function by use of physiologic tests is becoming increasingly important. Numerous methods are available and we have discussed some of the procedures in a previous article.[1] The application of laboratory studies to supplement clinical evaluation in providing an objective appraisal of pulmonary disability is particularly important in the military service. Evaluating the subjective complaint of "dyspnea" in terms of degree of disability by history, physical examination, and roentgenograms of the chest can prove very controversial.

In military medicine we are continually confronted with two major responsibilities in the evaluation of patients with diseases of the chest: (1) The profiling of persons following illness or on roentgenographic detection of abnormalities for physical fitness for either limited or general duty; and (2) the profiling of persons as to their physical fitness who are presented to physical evaluation boards for decisions regarding their type and degree of disability for retirement compensation.

The problem of determining these situations realistically and accurately is a tremendous one, and in the interests of the armed services and the person involved, a full measure of accurate and intelligent work must be done. The use of pulmonary function tests as aids and as supporting evidence in these proceedings, however, has been very limited. As a result the accumulation of controlled, organized, and standardized data has not been accomplished. We have been unable to find reliable tables for the disability profile of pulmonary insufficiency based on physiologic data.

From Walter Reed Army Hospital, Washington, D. C.

It has been our experience,[1] and that of many other workers in the field,[2-6] that physical examination and chest roentgenography are limited and often unreliable in estimating the status of pulmonary function for disability rating. A patient with diffuse radiologic densities, for instance, may have little or no disturbance in pulmonary function. Conversely, patients with relatively little or no radiologic evidence of disease may have severe pulmonary insufficiency or even complete pulmonary disability. Far too often, however, the anatomic status is considered first, last, and only. Once the anatomic status of the respiratory apparatus has been defined, all kinds of conclusions are drawn regarding its functional status. Usually such an evaluation stands as the final evidence for retirement, induction, general or limited duty status, the type of surgical or medical treatment indicated, and the diagnosis of disease. An organized study to investigate this problem is essential in order to meet the responsibilities of the medical mission in our country's defense effort.

One reason for the limited use of pulmonary function studies has been the wide variation in results obtained in normal persons. This has been a source of frustration and discouragement to many physicians. Only now are we appreciating that much of this was due to a lack of standardization in equipment and methods. Any program of study for working out this necessary classification of pulmonary insufficiency would have the task of determining the specifications and standardizations of procedures for use in the armed services.

Another reason for variation has been the tendency in the past to evaluate, with a single test, a group of supposed normal persons, as judged by history, physical examination, and routine roentgenograms of the chest. No single test, however, can adequately define the status of pulmonary function, and a group of tests is required to screen the various mechanisms which make up integrated function. The combination of tests which provide the most accurate and adequate screening of functional status has never been defined, nor has any large, well-controlled study been carried out to establish the answer. Reports appear in which small numbers of patients were studied, but at this time the results cannot be regarded as an authoritative basis for disability profile, duty disposition, and retirement compensation of military personnel.

A third area of significant shortcoming has been the almost complete absence of information on the relationships and correlations between the findings of pulmonary insufficiency as revealed by physiologic testing and physical disability classi-

fication. Adequate controlled study, definition of concepts, and synthesis of new ideas is most certainly needed.

CASE REPORTS

The following case reports illustrate typical situations in which pulmonary function studies offered a significant contribution in certain problems by providing the evaluation board with evidence for the best possible decision. Cases of this type are of common occurrence and provide for a large part of the function studies carried out in the medical chest clinic at this hospital.

Case 1. A 60-year-old man was hospitalized for medical evaluation prior to statuatory retirement. His chief complaints were exertional dyspnea on minimal activity, easy fatigability, and early morning productive cough. The symptoms were described by the patient as slowly progressive and annoying. Originally they were thought to represent manifestations of arteriosclerotic heart disease and myocardial insufficiency. He was studied in the cardiac clinic but his cardiac status was considered normal. During fluoroscopic examination, limitation of the diaphragms was noted, and he was referred to the medical chest clinic for further evaluation. The results of the pulmonary function studies are shown in table 1 and are indicative of a moderate degree of pulmonary insufficiency of a ventilatory type, primarily obstructive in nature, with a significant degree of emphysematous decompensation. This conclusion was supported by the following changes:

1. Vital capacity was slightly reduced to 85 percent of predicted normal. This single conventional determination, however, provided little if any insight into the nature and degree of the physiologic abnormality in this patient.

2. The ratio of the residual air to total lung volume was 45 percent, a significant increase over the predicted normal of 30 percent. This indicated a hyperinflation of the pulmonary volumes which was compatible with a moderate degree of emphysematous decompensation.

3. The maximum breathing capacity was diminished to 74 percent of predicted normal. Of equal importance was the character of the respiratory tracing obtained during the test performance. There was a significant shift of the midpulmonary position to a maximum inspiratory level, demonstrative of the air trapping and hyperinflation that are characteristic of obstructive emphysema.

4. The character of the helium dilution curve indicated a delay in the intrapulmonary mixing that is characteristic of the defect in distribution associated with the ventilatory impairment of emphysema.

5. The air velocity index of 0.87 further substantiated the findings and conclusions of an obstructive type of pulmonary insufficiency.

TABLE 1. *Pulmonary function studies on four problem cases*

Testing procedure	Patient 1	Patient 2	Patient 3	Patient 4
Vital capacity				
Predicted	4,100 cc.	4,800 cc.	4,170 cc.	4,700 cc.
Observed	3,400 cc.	5,000 cc.	4,900 cc.	5,000 cc.
Residual air				
Predicted	1,900 cc.	1,400 cc.	1,700 cc.	2,000 cc.
Observed	2,800 cc.	1,450 cc.	1,860 cc.	1,830 cc.
Ratio: $\frac{\text{Residual air}}{\text{Total lung volume}} \times 100$	45 percent	23 percent	26 percent	27 percent
Maximum breathing capacity				
Predicted	110 L./min.	160 L./min.	136 L./min.	146 L./min.
Observed	78 L./min.	158 L./min.	134 L./min.	126 L./min.
Dyspneic index*	87 percent	95 percent	94 percent	92 percent
Ventilation equivalent of oxygen**	4.1	3.2	2.4	2.6
Expiratory reserve	1,300 cc.	1,680 cc.	1,500 cc.	1,600 cc.
Inspiratory capacity	2,100 cc.	3,300 cc.	2,400 cc.	3,400 cc.
Total lung volume				
Predicted	5,900 cc.	6,250 cc.	6,500 cc.	6,700 cc.
Observed	6,310 cc.	6,360 cc.	6,700 cc.	6,730 cc.
Arterial 0_2 saturation			Rest 96 percent Exercise 98 percent	

*Dyspneic index $\frac{\text{Breathing requirement in liters at 37 C. X 100}}{\text{Maximum breathing capacity liters minute}}$

**Ventilation equivalent of oxygen $\frac{\text{Ventilation minute in liters at 37 C.}}{\text{Oxygen uptake per minute in liters STPD}}$

(STPD) Standard Temperature Pressure Dry Air

Comment. The addition of these pulmonary function tests to the study and evaluation of pulmonary emphysema provides a presentation of the patient's symptoms in terms of the functional dynamics. These tests permit a clearer, more emphatic concept of the disease process and associated impairments, and bring to light the error of confusing cardiac and pulmonary insufficiency. Their results emphasize that a serious degree of pulmonary insufficiency can be a major problem in persons coming before physical evaluation boards. They provide a means for rating degrees of pulmonary disability, and a basis on which standard-

ization in the classification of disability can be made. Finally, the evaluation of the process serves the patient by bringing to light a pulmonary condition that can be as serious, as disabling, and as progressive as any other chronic disabling disease.

Case 2. This 21-year-old man was hospitalized to determine whether or not he was fit for full military duty. His complaints were limited to the respiratory system and consisted of episodes of wheezing respirations, cough, and shortness of breath. He stated that this condition had been present for several years and was aggravated by cold, damp weather, and seasonal changes. He had been extremely active in professional sports, was a topnotch performer, and had been able to maintain a position on a professional ball team. Findings of his physical examination were normal at the time of admission and remained so throughout his hospital stay. A roentgenogram of the chest was normal. Pulmonary function studies were carried out and the results, which were entirely within normal limits, are shown in table 1. There was no evidence of emphysematous decompensation, as indicated by the normal residual air volume of 1,456 cc., which represented 23 percent of the total lung volume. An adequate ventilatory capacity was indicated in a maximum breathing capacity performance which was 92 percent of the predicted normal. The absence of pulmonary air-trapping and respiratory outflow obstruction was indicated in the timed vital capacity study which demonstrated that 96 percent of the vital capacity was displaced within the first three seconds. The character of the respiratory tracing showed a normal inflow-outflow pattern with no disturbances of rate, rhythm, or stigmata of expiratory delay.

Comment. The important features of normal residual air volume, adequate maximum breathing capacity, normal timed vital capacity relationships, and absence of respiratory outflow obstruction proved of fundamental value in the proper disposition of the patient to full military duty. In the presence of any significant bronchospastic disease, characteristic changes in the dynamics of ventilatory function can be expected. When the problem has been chronic, abnormalities in the ratio of residual air to total lung volume are usually present. This latter finding is of particular value in the evaluation of the patient with asthma during a so-called asymptomatic period. Not only do such function studies aid in the proper evaluation of the immediate situation, but through careful follow-up valuable information can be obtained regarding the natural history of various types of bronchospastic phenomena. To have standardized methods available for the quantitative evaluation of the subjective complaint of "dyspnea" would aid in the disposition of many types of "motivation" problems in the military service.

Case 3. A 34-year-old man was admitted to determine his fitness for full military duty. The problem was one of diffuse, bilaterally symmetrical pulmonary fibrosis, residual from a nonspecific pneumonitis. About eight months before the present admission he had had a mild febrile illness characterized by dry cough of four days' duration, weakness, elevation of temperature for three days, and slight pain in the left side of his chest for two days. Ten days prior to the onset of this illness he had been working in a dusty attic. At the time of admission a roentgenogram of the chest showed a bilateral, diffuse, symmetrical, nodular infiltration. An inclusive battery of laboratory studies failed to disclose a causative agent. Over a period of several weeks the patient improved in general well-being, and roentgenograms taken periodically showed resolution of the infiltrative process with residual diffuse, bilaterally symmetrical fibrosis of a moderately severe degree. The patient was discharged to limited duty for a six months' trial. At the time of admission for re-evaluation, he was entirely asymptomatic and afebrile. Repeat roentgenograms demonstrated the previously described diffuse, bilaterally symmetrical fibrosis to be essentially unchanged. Pulmonary function studies, which were entirely normal, are reported in table 1. Arterial oxygen saturation at rest and after heavy exercise was normal. The patient was returned to full duty.

Comment. This case indicates that pulmonary function and anatomic changes demonstrated by roentgenograms of the chest may not run a parallel course. The experience is consistent with findings reported by Wright and Filley[2] who showed that pulmonary fibrosis, even though extensive, may be entirely benign in its effect on functional status. This officer was highly motivated to remain on active duty, and possessed skills and training greatly needed in the defense effort. Before the results of his functional capacity were known, there was considerable doubt as to whether or not he should be allowed to continue on active duty. In addition to clarifying the situation as to duty status, essential information was documented about the disease process itself and the patient was reassured to learn that all measurable functions were within normal limits. Follow-up evaluation will provide important data on the natural history of this disease process.

Case 4. A 22-year-old man was admitted for cardiac evaluation because of complaints of chest pain, hyperventilation, dyspnea, and awakening from sound sleep with sensations of "suffocating." Cardiac evaluation was entirely normal. Because his respiratory rate at times ranged from 45 to 60 excursions per minute, medical chest evaluation was requested. The history was negative for pulmonary disease but revealed episodes of anxiety, psychosomatic symptoms, and neurasthenia. Fluoroscopic examination showed normal excursions in both leaves of the diaphragm. Pulmonary function studies on several occasions demonstrated marked variation in values. After a satisfactory

patient-physician relationship had been established, the patient completed a performance with all values within normal limits. The character of the respiratory tracing indicated anxiety with characteristic irregular rhythm featuring numerous deep, recurring "sighing" respirations. With final integration and evaluation of all available information, the condition was considered as being primarily psychiatric, and the patient was transferred to the psychiatric section for further evaluation and therapy.

Comment. The studies were of fundamental value in ruling out the presence of organic disease. They present a means for studying nonorganic types of dyspnea associated with anxiety and respiratory neurosis. Although the role of the respiratory system in the somatization phenomena is well recognized, clarification of the individual situation often poses a difficult problem. Furthermore, because of the serious implications of cardiac disease in young men, as much quantitative information as possible about physiologic status should be obtained. When anxiety is released through the respiratory system, certain aspects of pulmonary function studies can serve to document and demonstrate features which are not always well clarified by an interview or other conventional means. The character of the respiratory tracing is particularly valuable in providing a permanent record of the irregularities of rhythm in various testing periods, and as to how they correlate with mood swings. Knowledge of the variation in ventilatory values gained during separate testing periods is most valuable, for seldom will one encounter in organic disease the wide range of performance observed in functional problems. It is particularly interesting to observe changes in performance which are associated with an improving patient-physician relationship.

SUMMARY

Problems relating to the evaluation of pulmonary function are an outstanding feature of military medicine. To adequately carry out this responsibility physiologic studies must be available to medical installations at all hospital levels.

Experience gained at this hospital leads to the conclusion that, at present, physiologic testing in diseases of the chest has not received its full share of attention and application. A controlled study is needed to determine the most effective manner in which available methods for pulmonary function study can be used in military medicine. An adequate battery of studies for screening should be defined. In particular, data on the physiologic classification of pulmonary disability should be accumulated and standardized to aid in disposition of military personnel either to duty or retirement with proper compensation for physical disability.

The four cases reported in this article illustrate the type of problem which arises in evaluating pulmonary function, and the contribution which physiologic studies make in evaluation.

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THE DOCTOR WRITES

Why do doctors write? The motives of some are noble, those of others are not. There is, first of all, the anxiety to share with one's colleagues worth-while information. Such a desire is sacred and should not be profaned, for dissemination of knowledge is essential to the progress of medicine. How frequently, however, does not the urge to show off the writer's knowledge exceed his eagerness to improve that of the reader!

Then there is the itch to write in order to advertise one's intellectual or technical accomplishments, to build up a large and lucrative practice, or merely to justify one's academic standing in the eyes of colleagues and of the powers that be. Unfortunately, many physicians, proud of belonging to a profession that is—or should be—both learned and literary, are animated by the prejudice that professional success can be measured only with the footrule of literary output. The universality of this belief scarcely lessens its pathos. While it is generally accepted that the only ethical or genteel way in which a doctor can advertise himself and his wares is by writing scientific papers in the medical journals or medical articles of popular interest in the lay press, the risks of such a practice are not always realized. Wilfred Trotter's warning is pertinent: "When the poison of publicity once gets into a doctor's veins, there is no cure, medical or surgical."

—W. R. BETT
in *Missouri Medicine*
p. 1016, Dec. 1954

GROUP THERAPY AT AN ARMY MENTAL HYGIENE CENTER

DONALD G. LINDSAY, *Captain, MC, USA*

THE PROBLEM of increasing psychotherapeutic efficiency in the military service is of far-reaching sociologic as well as military importance. A maladjusted person who is separated from the service is in most cases permanently lost from the manpower reserve, and those salvaged not only represent manpower conserved for defense but also a stronger, healthier society. A great advantage offered by group therapy is a marked increase in psychotherapeutic efficiency. A psychotherapist can confer with 80 to 100 patients a week in group therapy in addition to his other duties. Thus the function of the military psychiatric clinic becomes oriented more toward salvage and rehabilitation than toward disposition and environmental manipulation, with its resultant problem of secondary gain.

ADVANTAGES AND DISADVANTAGES OF GROUP THERAPY

It must not be thought that group therapy is valuable solely as a time-saving substitute for individual therapy, for it has therapeutic advantages peculiar to itself. Although in most instances it is more difficult for the therapist than individual therapy, group therapy in certain patients is valuable when combined with individual therapy because it allows two distinctly different patient-therapist relationships as well as other advantages peculiar to each method. Not the least of the advantages of group therapy is the opportunity it offers the military for much-needed research in group dynamics.

One of the main disadvantages of doing group therapy in a military setting is the constant change of patients. This not only reduces the time available for treatment but requires continual readjustment within the group, which is particularly disrupting to therapy. This situation can be partially controlled by the plan for group therapy described herein. The length of treatment time available is not so much a problem if the therapist is flexible in his therapeutic methods and goals. Another difficulty is that of getting eight trainees together in one place at one time. The best way to solve this problem is to have good liaison with the

From U. S. Army Hospital, Fort Ord, Calif. Dr. Lindsay is now at 9517 Arrington Ave., Downey, Calif.

line officers and noncommissioned officers. In this the military social worker in the field is invaluable. If the therapist knows the company officers and noncommissioned officers personally and there is mutual respect, regulations and schedules do not seem to interfere.

GROUP THERAPY IN THE MILITARY SETTING

Changing the membership of a group unquestionably slows progress, even though an occasional new member is well tolerated. In an Army mental hygiene center the therapist will commonly start with a group of eight and after three weeks, because of pressure from the line cadre, shipment to another station, or poor motivation for treatment, find only four members remaining.

Here, the therapist must combat his own feelings of failure, and first of all forget those who have not returned. They have received some teaching and even this will often simplify their management at the dispensary or in the company. The natural tendency is to get discouraged and neglect those who remain; however, these are the better candidates for treatment. A sure way to discourage them is to place them with four new members and repeat the early phases of treatment.

A good method is to start blocks of four groups of eight members each and plan to get one long-term group from this. The therapy is at first directive and superficial with gradual progression to more advanced, nondirective technics. After the first three to five meetings, the four groups are consolidated into two therapy groups. These two groups will remain from 10 to 12 weeks in a basic training center. When it becomes necessary to consolidate these two groups, the result is a group that is motivated for therapy and physically able to continue.

PATIENTS WHO DO WELL IN GROUP THERAPY

A group of military patients especially suited for group psychotherapy is made up of soldiers who do not socialize well. Common problems encountered in this group are: (1) language difficulties, (2) lack of formal education, (3) meager cultural background, (4) withdrawn schizoid tendencies, and (5) immaturity and homesickness. One or two of these patients are put in a group but are not pushed to participate, and yet not ignored. The group invariably rallies behind them and they gradually come to participate freely in the group discussion and increase in self-confidence, which seems to carry over to their activities in larger groups. They also acquire knowledge of the dynamics behind their patterns of withdrawal. The therapist has to gradually lead the group away from over-supporting these people if they are to be desensitized tc criticism and taught to respond in a more open, aggressive manner.

The soldiers whose psychiatric illnesses are expressed through somatic complaints are a great problem at the dispensary level. The dispensary medical officer does not have the time to explain their condition to them and so relieve their anxiety. Frequently he tends to aggravate their anxiety and hence their symptoms. Often merely telling the patients that their symptoms are due to emotional or motivational difficulties does not suffice. From their point of view, they have symptoms and have not even been examined. These people keep returning on sick call. Such soldiers can be placed in a group and helped greatly. First of all, they are encouraged to talk about themselves, in fact, allowed to talk themselves out. They must also sit and listen to the other members do the same thing. An attempt is then made to tell them in language they can understand, and as much in terms of their own experiences as possible, the cause-and-effect relationships existing between their symptoms and their emotional problems. From this, they are guided toward uncovering and working through their emotional difficulties. The members support each other, and a therapeutically useful *esprit de corps* is developed. In terms of their behavior within the group, an attempt is made to wean them away from expressing their conflicts through symptoms. The meetings are structured so that the group itself does this. In the group, a member will be able to see how another member is hiding behind his symptoms, how he resists giving them up, et cetera. One member may point out how another lapses into complaining about his symptoms when the group gets close to his problem. The group also becomes intolerant of symptoms, demanding their repression, and the members work on their underlying problems. Therapy is mostly along psychobiologic lines. Such group therapy, combined with the occasional intelligent use of adjunctive measures such as an ergot preparation in some patients with vascular headaches and exercises in those with backache, will enable many of them to remain compensated and do Army duty.

If the therapist is successful in getting over the initial hurdles of his patients' suspicion, hostility, acting out, and attempts at manipulation and testing of himself, a group of mild to moderate antisocial personalities and hostile aggressive soldiers will develop a surprising amount of group loyalty from which they will derive therapeutic benefit. Even though this group may be lined up solidly against outside influence, good group support and direction is enough to enable a number of them to adjust and tolerate the necessary demands from outside the group.

Probably one of the groups most fruitful to treat is one with patients who have difficulty adjusting to the military authoritarian culture. This difficulty is usually based on a neurotic child-parent relationship. These people in civilian life are able to stay compensated and are often valuable and well trained.

They break down, usually in basic training, when they are faced with more rigid authoritarian control, combined with lack of gratification of their immature dependent needs.

In treating these people, as with antisocial types, the therapist must be a leader. He must be very adept at handling his authoritarian role and must know clearly himself how and why he conforms to this same authority. He must be able to accept and handle hostility and the problem of secondary gain. In short, he must be able to manage the kind of ambivalence found in any child who must adjust and conform. The child, however, cannot run away from his parents as easily as can these patients from the therapist. The problems of manipulation of the therapist, of secondary gain, and of psychotherapy in an authoritarian setting will be discussed at greater length later on.

A completely nondirective approach early in the treatment of such patients is valuable. At the first meeting the therapist merely comes in, sits down, and says nothing. This can be allowed to go on as long as the therapist can remain comfortable. He will observe a gradually increasing anxiety and hostility at the lack of rules and direction. This can be interpreted for the group. He can then allow the group to interact freely, and allow or tacitly encourage their expressions of defiance toward authority. As this flaunting of authority continues, signs of anxiety in the members will develop because of lack of control and rules and signs of disrespect toward the therapist. He then has the opportunity to demonstrate these ambivalent feelings and, if he does not betray anxiety, his repeated interpretation of the dynamics of the situation will be helpful. If he feels anxiety, it will immediately be sensed and will increase the anxiety of the group, prompting it to manipulate him. In short, any group must have and will anxiously search for limits; it is continually testing the limits under which it functions. This dynamic process can be used as a powerful tool in helping soldiers adjust to more authoritarianism.

SELECTING PATIENTS FOR A GROUP

A group of patients with mixed problems is often more responsive to therapy than one with patients with similar personality problems, diagnosis, dynamics, sex, age, et cetera. The therapist can attempt to balance groups on a more operational basis. There should be a few talkative ones, a few withdrawn ones, a few sympathetic, empathetic ones. No more than one very hostile or one depressed person should be included. Depressed or very hostile patients impede progress in a mixed group, as do the patients who talk continually to keep down their anxiety. Certainly, various degrees of motivation for therapy and ability to accept insight are very important considerations in forming a group.

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The effects and ramifications of sibling rivalry in each member and an estimate of how they will affect the group dynamics are important. In the military situation it is important not to mix patients who have profile changes with those who do not.

Often it is helpful to have a few individual interviews before placing a patient in a group. Most important, in the military, groups can be formed at random after the initial interview and then, through use of the plan for consolidation and regrouping, be reformed with much saving of the therapist's time. In fact, by this method groups tend to form themselves, and from such groups the therapist can learn more about the therapeutic value of the group make-up.

Before placing a man in a group it is extremely important to decide early whether or not he will require administrative disposition, because once in a group he will not be given such a disposition. The whole atmosphere is that members are expected to adjust. If it becomes obvious that a member must be discharged, the therapist should allow the patient to go on until the pain of outside pressure, plus lack of satisfaction from the therapy, forces him to drop out of the group; then a social worker sees this patient and gets him to a fellow psychiatrist for disposition.

SOME ASPECTS OF GROUP DYNAMICS

Group therapy is more difficult than individual therapy for the therapist because he feels more threatened. It is something new, and he has his normal skepticism as well as doubts about his ability to do group therapy. The hostile group is quick to sense these feelings and to play them for all they are worth. Such action prompts the therapist to defend himself instead of to accept and eventually interpret the hostility. This defense encourages the group to another onslaught, and many therapists never get beyond this point. Often, if the therapist must preserve his dignity, he will, from there on, be doing only that or else blocking communication by use of his authority. The aim is to move the group through interpretation and not let it bog down. Every group, like every individual, resists insight, and hostility and resistance are more difficult to manage in a group. Although silence in group therapy is more distressing for the therapist than it is in individual therapy, strong positive transference anxieties and especially sexual anxieties are easier to control.

Group therapy is harder than individual therapy for the therapist in other ways. The therapist's dynamics seem to be more obvious, as, indeed, do the patient's. It is easy for the therapist to be fatherly, familiar, and friendly with one person; it is harder to invest his libido in a group. It is more difficult for the therapist to recognize and control his own hostility and the effects of his

own experience with sibling rivalry. Feelings of sibling rivalry in the patients are very acute, and a show of favoritism can be very damaging, but also therapeutic. Both the therapist's and the patients' reactions to this should be interpreted, and the group tacitly encouraged to bring up at any time their resentment, feelings of jealousy, et cetera.

Handling hostility is one of the most difficult but important technics to learn if the therapist is to do successful group therapy. It is best learned by being himself a patient in a group. In many ways he will be a better group therapist for such an experience. Even more than with individual therapy, group interaction occurs in such a multitude of subtle ways that first-hand experience and working through of his own feelings is essential. It is helpful if he can conduct several group sessions with another therapist sitting in to check and point out instances where he has headed off expressions of hostility, stopped its development, or showed evidence of anxiety in the face of hostility. This technic, of course, can be used with other aspects of group therapy.[1]

The therapist, especially during the first few sessions, is continually under every kind of pressure to be provoked, and the slightest sign of a need to defend himself or of any anxiety will bring on more testing. It is the therapist's inability to accept and interpret hostility that is mainly responsible for a group so hostile that therapy becomes impossible. Improper handling of hostility also has much to do with absenteeism. Hostility must be accepted and at the proper time interpreted. The ways in which hostility is expressed (and the way it is conveyed to the therapist) are often felt rather than understood, or not realized until long after the meeting.

There are practical methods of managing more direct hostility. For example, if the patient asks the therapist an embarrassing personal question, such as, "Doc, did you ever masturbate?" The therapist is in a dilemma. If he says "No," he will be suspect anyway, and will show evidence of not being able to accept in himself what he purports to accept in them. If he says "yes," he will probably be embarrassed and be "weaker" than the members who have not had to take a stand. The therapist can say, "I will answer this, but first we should have a clear understanding of why it was asked." During this discussion the therapist can point out that one reason the question was asked was to convey hostility and the reasons for these masked feelings are then put up to the group; invariably the discussion is taken up and carried along for some time. The question also conveys, "Doc, do you really believe this stuff? Aren't you a bit hypocritical?" Before the session ends, the therapist should answer it, "yes" or "no." If

not, the fact that he wiggled out of answering will be brought up again, directly or indirectly. Also, he will find that, after a discussion of the dynamics and dissipation of the tense feelings behind the question, no one is too interested in the answer. All are immensely interested in the fact that the therapist acted openly and in good faith, and that he calmly and freely submitted to the same self-scrutiny that caused them anxiety.

Another similar problem that comes up again and again is connected with dependence and with the common attitude toward medical treatment. This has many familiar variations. It may be expressed by, "Here I am, Doc. Now it's up to you to get me well," or "I'm not getting a bit better," or "Doc, you mean this talking is going to cure my headache?", et cetera. The feeling is either that the physician knows what to do to help and he isn't doing it, or, equally bad, that he doesn't know what he is doing. Here again it is necessary to push aside the spoken words and show the group the feeling (hostility) and what is behind it (rejection of dependent needs). This handling of dependence and the gradual establishment of a therapeutic relationship wherein the patient accepts responsibility for working out his own problems is too familiar to require further elaboration.

If the group feeling is directed so that the therapist is the center of attention and each member talks to him, or through him to the others, although the group is less anxious and absenteeism is lower, the possibility that he will have difficulty with the problems of hostility later is increased, and he will have difficulty getting the members to accept his interpretations. If the therapist stays on the periphery and forces the members to deal with each other (for they will instinctively try to force the therapist into the center), there is initially as much or more hostility toward him, but he is in a much better position to impart insight and work members against each other. In the military situation, with poorly motivated patients, the latter method, if used early, often produces so much anxiety that absenteeism is a problem. An early directive, superficial atmosphere shading gradually into a nondirective one is perhaps more practical.

A group has movement. This means more than the constant talking of members or the fact that most of the members are entertained. Perhaps it could best be defined as a period of freedom from resistance. There can be definite movement in periods of silence. The group (as well as the therapist) senses lack of movement and members are acute to sense when the therapist is anxiously fighting to maintain movement. The group tends to resist movement, yet is anxious when it stops. Group sessions are slower to start and harder to stop than are individual sessions. The therapist may struggle to maintain movement, but he must be

particularly subtle and free from anxiety in his methods of doing this. A big fear of the beginning therapist is that he will not be able to "keep the group going." One of the first things he must do is develop the ability to be comfortable during periods of silence and manipulate them for therapeutic benefit. Long periods of silence early in therapy may become nonproductive and filled with hostility. In the early teaching phases of group therapy, under the plan discussed herein, long silences are not allowed. One way to handle them is to ask, "Why the silence? What does it mean? Why did it happen now?" Perhaps someone will say, "Because we have no more to say." Again the therapist asks "Why?", or "Why at this particular point?", et cetera, and usually a discussion along therapeutic lines follows. In other words, the silence becomes a rallying point about which the group moves.

PROBLEMS IN MILITARY GROUP THERAPY

A free flow of communication simply is not achieved in an authoritarian setting; however, too much has been made of the cramping effects of the military culture on psychotherapy. In civilian life we are in many ways in similar positions toward authority. Civilian psychiatric patients who confess or threaten crimes and those who make sexual advances present problems basically very similar to the soldier who will not do duty or who wants a profile change or a discharge. To handle these problems in military, as in civilian practice, we must know ourselves, know our patients, structure the treatment situation so that such interference will be at a minimum, and, above all, interpret emotions.

Too many of us too greatly enjoy the power the military gives us. In the military psychiatrist, the combination of this need for power with the hostility he may feel toward the authority over him, covered by a veneer of rationalization, produces a psychiatrist better suited for disposing of patients than for treating them. Such a person has difficulty in attaining firmness and still maintaining rapport. He is continually worried that things are going to get out of control. Every military psychiatrist must decide how much authority he requires, how this may be preserved, and how much may be eliminated in the interests of psychotherapy.

The patients are told that, just as in civilian life, during the treatment time and in the confines of the room there will be no army, no rank. The physician wears a white coat, but most important is his attitude. The feeling tone he conveys and produces in the patient is the crucial thing. The emphasis is on therapy and the impression is conveyed that environmental manipulation of any sort just is not done. In such a setting, group interaction in military practice can be built on the basis of mutual openness, trust, and respect, just as it is in civilian practice. It is amazing how much such a group will tolerate. The hostility, divested of

some of its fearfulness to everyone, assumes a more benign character. The members accept hostility from each other and often even try to be helpful in face of it. Usually the whole group will rally to support the hostile one and will accept his outbursts as therapeutic abreaction. Once this atmosphere is established, therapy moves rapidly.

In summary, then, every member of a group is in need of rules to govern his behavior and becomes anxious if he does not know the limitations imposed on the group. He watches anxiously to see if intragroup tension is getting too high; the individual intensity of these anxieties varies with each person's personality. Limitations can and should be made, but the way in which they are made markedly influences the progress of therapy. A skillfully constructed, flexible, nonprovoking boundary that changes with the group's own anxieties and need for control would seem best.

THE PROBLEM OF SECONDARY GAIN

The more the military psychiatrist can eliminate from his methods any suggestion of secondary gain, the better therapy he will do. To be sure, the psychiatrist's job is neither to change the Army to fit the soldier, nor to change the soldier to fit the Army. His task is to help them both to fit together, for there are aspects of both he cannot change. The best way for him to manage the problem of secondary gain is simply not to allow any to his patients. The patient should be given the understanding that he is there for treatment, and that the therapist has no idea but what treatment will be successful. If the patient seems to require disposition or environmental manipulation, the therapist can arrange for a fellow psychiatrist to take care of such matters. Then the patient can be told that the therapist does only therapy; if the patient is interested in disposition he must see another member of the staff. After seeing the patient in a group the therapist is well able to decide what should be done and behind the scenes should assist the other staff member. This does not prevent the patient from returning for therapy; however, patients who have received profile changes are treated in separate groups.

It is sometimes frightening how desperately some patients will beat their head against such a wall. Many adjust, however, continue therapy, and do good service. All this assumes accurate diagnosis, faith in one's decisions, good treatment, and good liaison with the line officer. As the therapist's experience increases, he will find his need for the other psychiatrist decreases.

Early in treatment the patient may be told that military psychiatrists and their patients have a special relationship. The soldier patients may freely express themselves. The psychiatrist in turn has no power to change the Army for them. Sometimes it is helpful to tell the patients that we learn always through effort and

discomfort and that their problem is not far removed from the discomfort and rebellion experienced when they learned to go to the toilet, eat with a spoon, et cetera. The therapist learns to empathize but yet not to be taken in. He cultivates an atmosphere in which the patient will feel he is there to learn, to adjust, and not for any other reason; that adjustment is hard, but necessary and profitable; and that running away never solves the problem, and is impossible anyway. The therapist who has the skill and self-confidence to maintain this atmosphere gradually produces a group that will accept the responsibility for getting well. This results in a group with high morale. The atmosphere engendered by immature, hostile, dependent demands is replaced by close group feeling. The members begin to see humor in their troubles. The more inspired ones help the others along and a type of therapeutic situation impossible to create in individual therapy is developed.

Some members will begin to bring their demands to the therapist privately after the meeting. These matters are handled privately, but the patient is told that the matter will be presented to the group at the next meeting. This is done with each such request, and the patient's reason for the request as well as his reason for making it privately is discussed by the group. The group soon becomes intolerant of any persistent attempts at manipulation. The therapist's emotional need to be the all-giving deity, his own hostility, and his secret sympathy with the patients make it harder for him to handle this problem of secondary gain.

In an Army basic training center open ward treatment of psychiatric patients has no place. Such handling enormously increases the problem of secondary gain, increases the chances for the development of nontherapeutic patient-psychiatrist relationships by causing the psychiatrist to assume conflicting roles, and in many other ways slows therapy. Adjustment is hard and, if patients can see that they have forced their removal from the scene of conflict, if they are even slightly less traumatically situated, the therapist is working at a great disadvantage. On the other hand, the outpatient is still in training. He is threatened with disciplinary pressure and the disapproval of his outfit. There isn't hope of a way out. Here is a setup conducive to adjustment!

As the therapist becomes more experienced with military psychotherapy, especially in the evaluation of suicidal risks, his hospital admissions decline. Pressure from the line to get rid of these soldiers is best controlled by his own personal liaison and through field social workers. The line cadre must understand what he is doing.

THE GROUP MEETING

For most beginners, the actual starting of the first group therapy session is a big hurdle. An oversimplified and somewhat dogmatic

account of a first meeting and the general form of later meetings will illustrate one approach. The personality of the therapist, however, will determine how he starts the meetings, and will have a great deal to do with their whole atmosphere.

The therapist may start by telling the patients that they are there because they have common problems, even though on the surface these may appear quite different. Certainly one problem they have in common is that their feelings play a big part in their difficulty. An effort will be made to discover the relationship between their feelings and their symptoms, why they have the feelings, and how to go about altering these to provide more comfort at present and to prevent future vulnerabilities. The group is told that there is no rank in the room; that they have complete freedom of expression. If he is more dramatically inclined, the therapist may say, "If you feel like crying, all right. If you get mad, all right. If you don't like me, or someone else's looks, say so. The only thing I require is that you stop short of blows. We are not so concerned with right and wrong in here as we are with *why* you feel and act the way you do." Each member may then be asked to state his problem. Then the therapist's job is maintaining free communication or quietly analyzing his and the patients' feelings.

Hostility and demands are sure to be encountered early but they gradually fade away as they are undermined by correct interpretation of their causes. This procedure is the basic tool with which the therapist works. He must constantly try to find out what really is happening in the group—why are the members speaking, acting, and feeling as they do? Because the therapist may spend most of the time in the first meetings encouraging ventilation and using every opportunity to teach mental hygiene, the feeling tone of the group as a whole may escape him, but it must ever be noted carefully.

When a patient asks how his symptoms could be alleviated the therapist, by using his knowledge of the effects of emotion on body physiology, can make the relationship between feeling and symptom sound plausible. It is not necessary for explanations to be scientifically correct, but they should be vivid and easily grasped. They should convey the feeling that there is some rational, sensible basis for this business, that psychotherapy is not so esoteric and anxiety provoking as the patient had feared, and that perhaps he should examine his feelings. Other aspects of mental hygiene are approached in this same way.

Knowledge of the physiology behind body symptoms in itself often is a big help to the patient. This is especially true in such conditions as vascular headache, cardiac neurosis, psychogenic gastrointestinal difficulties, et cetera. Such discussions can be

the first step toward the patient's understanding of the causes of his trouble and can lead to an examination of deeper reasons, *i. e.,* to discussions of dependence, ambivalence, perhaps child-parent relationships, mechanisms of defense, et cetera. They will also lead to ventilation and discussion of the way the patient was treated at the dispensary, and of his other grievances toward the Army and to further emotional expression.

In this atmosphere of free communication, with logic and feeling flying in all directions, the therapist observes what actions he can. What are the relationships between the members? Why do cliques form? When and why do they change? Why do some members not participate, and should an effort be made at this time to draw them into the discussion?

As the group progresses, perhaps after three or four sessions, the therapist gradually begins to drop back—there is plenty to observe—and to follow where the patients lead. The character of the meetings then tends to fall into a pattern which seems to repeat itself in each group. First, there is the development of and adjustment to the group atmosphere; second, the testing out of intermember, interclique, and member-therapist relations. Then, out of the concurrent ventilation, mutually supportive group feeling is established. Communication is freer and the members, having gotten to know each other more intimately, develop stronger transference feelings and intragroup loyalties. The point is reached where the group functions in an open, intimate manner, where any member feels free to discuss almost anything. The other members feel sure of tolerance and do not hesitate to discuss the feelings or experiences others bring out or to bring up feelings of their own that the discussion may have brought to mind. In this way and with some guidance from the therapist, the group gradually explores its experiences, uncovers repressed material, and provides an excellent medium for corrective experience. With the help of the therapist, dream analysis and transference analysis is used. The therapist then finds his role gradually changing from that of teacher of mental hygiene to that of psychobiologic psychotherapist, and, finally, to that of therapist along more psychoanalytic lines.

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CHANGES IN THE PROTHROMBIN COMPLEX AFTER TOTAL BODY IRRADIATION

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ACUTE irradiation of the body is the cause of disturbances in blood coagulation which are not yet entirely understood. Investigations on human beings have been possible only in Japan[1-3] or after accidental irradiations.[4]

After irradiation of animals, such as dogs, with the $L.D._{100}$, a hemorrhagic tendency is evident. Severe thrombopenia is one of the causes of this syndrome.[5-13] Jackson[14,15] demonstrated that prothrombin consumption decreases with the number of thrombocytes. Prolongation of the clotting times occurs frequently at the same time, but this is not always the case.[16]

Disturbances other than the diminution of the number of platelets seem to occur in blood coagulation. Allen's hypothesis[16,17] that heparin would be present in the blood should be discarded[5,8,13-15,18,19] but the possibility that other anticoagulants may be present cannot be excluded. Jacobs and associates[20] described a decrease in the concentration of the serum prothrombin conversion accelerator (SPCA) (convertin) present in the serum of irradiated animals.

TECHNICS

Irradiation. Our dogs were irradiated over the entire body with x-ray lamps of 200 kv. and 15 ma. The animals were always turned over after half the dose had been given.

Investigation of blood coagulation. The platelet count was determined by means of Van Goidsenhoven's[21] technic and the clotting time, by the Lee-White method. The plasma recalcification time was determined as follows: A volume of citrated plasma was recalcificated with an equal volume of a 1/40 molar $CaCl_2$ solution. The heparin tolerance test consists in measuring clotting times of recalcified plasma to which known quantities of heparin are added. The prothrombin time following a "one-stage" technic was done as described by Quick;[22] the specific

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determination of prothrombin, accelerin (Ac-globulin), and convertin were performed according to the methods of Koller and

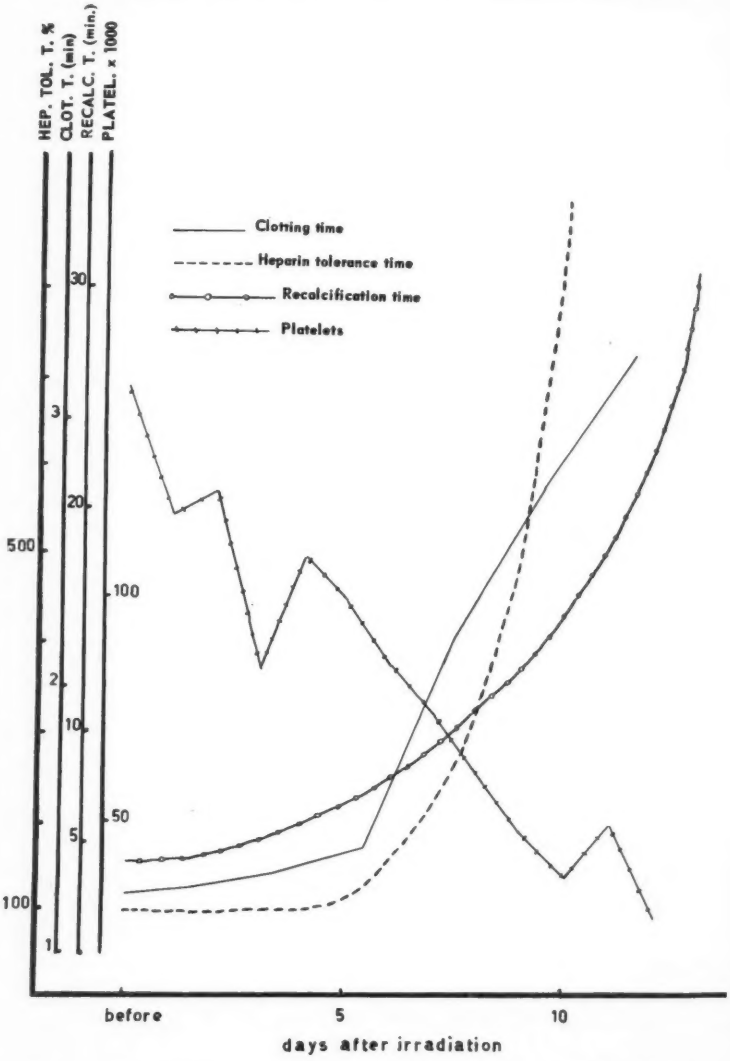

Figure 1. Mean values of the clotting and recalcification times, the heparin tolerance test, and the number of blood platelets in irradiated dogs.

associates[23] and Larrieu and co-workers;[24] and the fibrinogen concentration was determined photometrically.[22] Antithrombin was

determined by a "one-stage" technic as follows: A known quantity of thrombin was added to citrated plasma and the coagulation time was determined and compared with the one found on normal plasma. In the determination following a "two-stage" technic, a known amount of thrombin was added to the defibrinated plasma and its inactivation was followed. The thromboplastin generation test was done as described by Biggs and Macfarlane.[25]

TABLE 1. *The prothrombin time as measured by the Quick technic in irradiated dogs. (Results are expressed in percent of normal)*

Dog	Before irradiation (percent)	Days after irradiation									
		6	7	8	9	10	11	12	13	14	15
		Percent									
3	100		50	100	100		100	32	35	30	28
4	100	100		100			46				
5	60			23	<5		<5				
6	100			75	50		65				
7	50			75							
11	100				48						
12	100		75	48	19						
15	75		60								
17	50		35		38						
21	60		60		38	35					
22	100	50		38	35						
23	55	35	28								
24	50		52				60				
26	100	100		75	100	100					

RESULTS

From observation and autopsy study of a series of dogs irradiated with 400 and 600 r., we found the classical hemorrhagic syndrome in 16 of the 17 animals. We found a gradually increasing thrombopenia, a lengthening of the clotting and recalcification times, and a lengthening of the heparin tolerance time (fig. 1). It should be mentioned that in many animals the clotting time during the last days before death was greatly lengthened, and the blood was almost totally incoagulable.

The results obtained with the "one-stage" prothrombin time are given in table 1. A prolongation is found in a certain number of the animals, but the amount of accelerin does not seem to be influenced by the irradiation.

The prothrombin concentration was decreased in 10 of the 15 dogs on which this determination was made (table 2). There was a significant decrease in the amount of convertin in 13 of 15 dogs (table 3). After irradiation there exists, as many investigators have already indicated, an increase in the fibrinogenemia. We have never found any increase in antithrombin either with a one-stage or a two-stage technic.

TABLE 2. *Prothrombin concentration in plasma of irradiated dogs, expressed as percent of normal*

Dog	Before irradiation (percent)	Days after irradiation									
		6	7	8	9	10	11	12	13	14	15
		Percent									
3	100		100	100			100	53	51	70	70
4	100	100		100			100				
5	100			75	52		37				
6	100			100	100		100				
7	75			100							
11	100				64						
12	70		65	100	47						
15	100		100								
17	70		68	100	100						
21	100		100		70	15					
22	70	67		60	55						
23	70		52								
24	68		40				68				
26	100			68	100	100					

The thromboplastin generation test gave results that show a severe disturbance in the formation of the thromboplastin after irradiation (fig. 2).

Only in some of the animals was thrombopenia the cause of these disturbances, and in these the addition of platelets from a nonirradiated dog gave an increase in the formed thromboplastin to a normal level (fig. 3).

In another group of animals a decrease in the serum factor needed for thromboplastin generation was the cause of the abnormal results obtained in the thromboplastin generation test. In those cases the addition of normal serum, acting as a source of convertin and Christmas factor,* brings the result back to the

*A plasma thromboplastin component which is lacking in a hemophilia-like disorder.

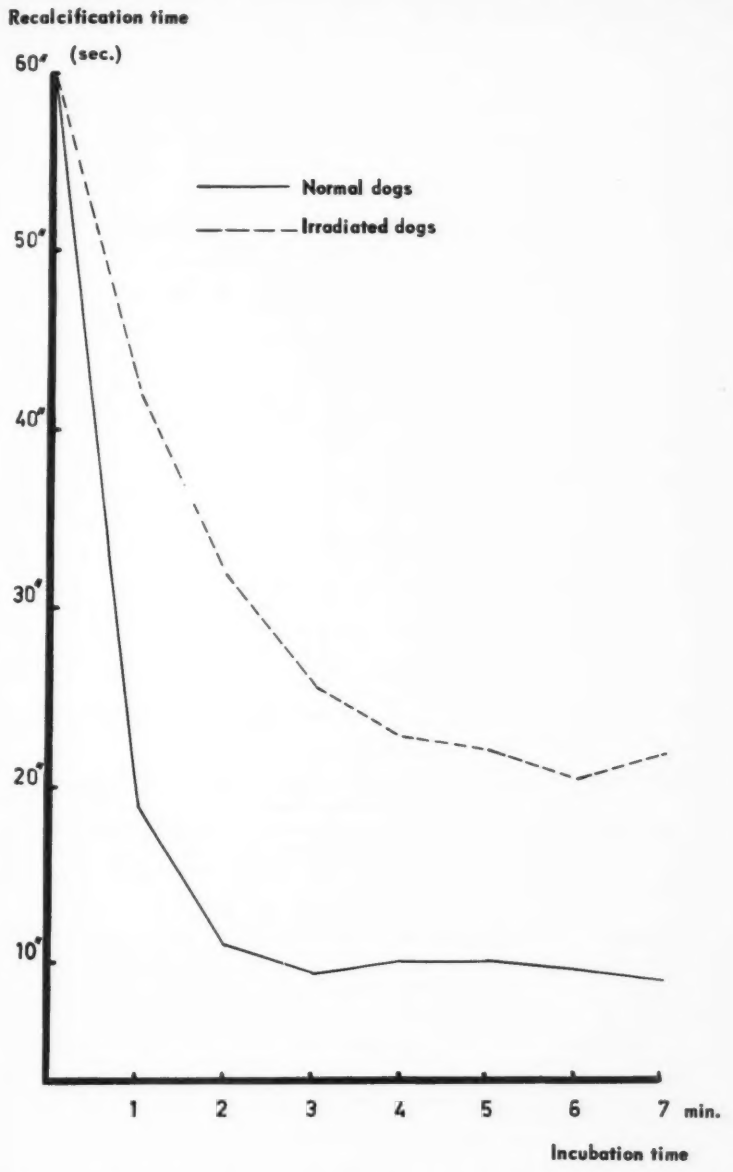

Figure 2. Thromboplastin generation test in a series of normal and irradiated dogs about eight days after irradiation.

normal (fig. 4). In some animals, we found a combined lack of a compound in the serum and of platelets, and a normal result in the thromboplastin generation test was obtained only when these two compounds were substituted by normal reagents (fig. 5).

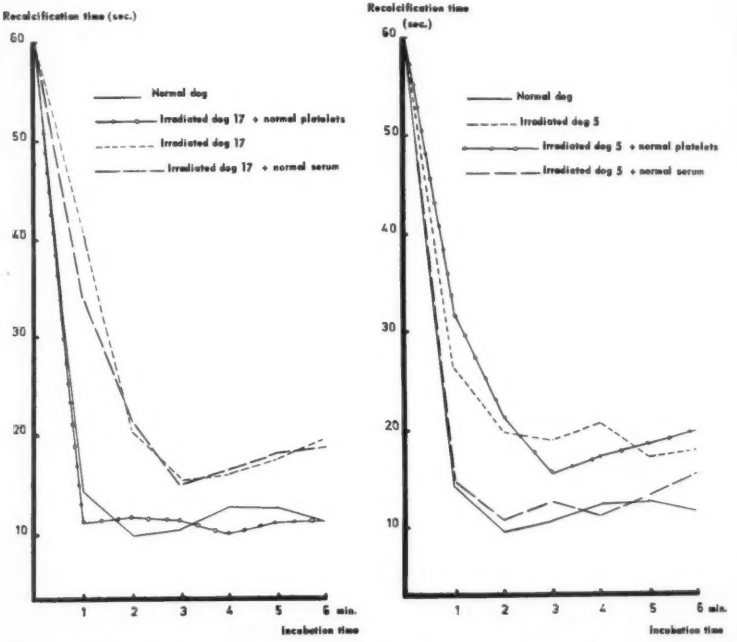

Figure 3. Thromboplastin generation test with a mixture of components from dog 17 (seven days after irradiation) and normal components. The results demonstrate an insufficiency of blood platelets. Figure 4. Thromboplastin generation test with a mixture of components from dog 5 (eight days after irradiation) and normal components. The results demonstrate an insufficiency of convertin.

Determination of the Christmas factor and of the antihemophilic globulin was made in the following manner: The plasma to be investigated is added to plasma containing the Christmas factor or that from a hemophilic patient, and the recalcification times of these mixtures are compared with that of the same experiments where normal plasma is used. We have thus found that the amount of Christmas factor and of antihemophilic globulin is normal in our irradiated animals.

Plasma recalcification times of plasma mixtures: *Addition of normal plasma.* The results of these tests are given in table 4. A small amount of normal plasma brings the results to normal

values again. This is an argument against the presence of an anticoagulant as a cause of the disturbance in blood clotting.

TABLE 3. *Convertin content in plasma of irradiated dogs, expressed as percent of normal*

Dog	Before irradiation (percent)	Days after irradiation									
		6	7	8	9	10	11	12	13	14	15
		Percent									
3	100		68	100			66	48	42	66	57
4	100	70		100			100				
5	100			24	< 5		10				
6	100			80	66		63				
7	75			60							
11	100				48						
12	80		45	70	13						
15	100		70								
17	75		48	100	65						
21	100		100		75	18					
22	100	45		43	42						
23	65	63	33								
24	75		45				45				
26	80	55		70	100	100					

TABLE 4. *Recalcification time on plasma mixtures from normal and irradiated dogs*

Quantity		Dog 17 9 days after irradiation	Dog 21 8 days after irradiation
Normal dog plasma	Irradiated dog plasma		
0.1		1 min. 4 sec.	1 min. 1 sec.
0.09	0.01	1 min. 17 sec.	1 min. 9 sec.
0.075	0.025	1 min. 11 sec.	1 min. 17 sec.
0.05	0.05	1 min. 11 sec.	1 min. 21 sec.
0.025	0.075	1 min. 14 sec.	1 min. 26 sec.
0.01	0.09	1 min. 5 sec.	1 min. 47 sec.
	0.1	3 min. 3 sec.	4 min.

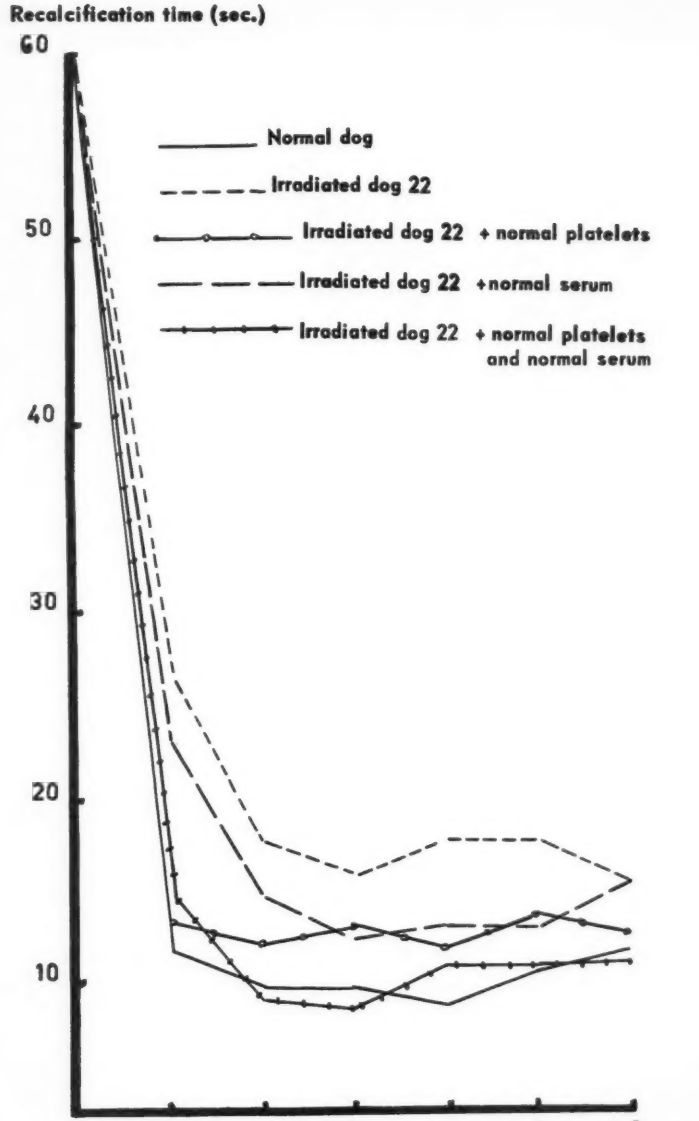

Figure 5. Thromboplastin generation test with a mixture of components from dog 22 (seven days after irradiation) and normal components. The results demonstrate an insufficiency of blood platelets and convertin.

TABLE 5. *Recalcification time (R. T.) and heparin tolerance time (H. T. T.) of mixtures of plasma from irradiated dogs and patient on bishydroxycoumarin*

Quantity		Normal dog plasma		Plasma from dog 21 10 days after irradiation	
Dog plasma	"Dicumarol" plasma	R. T.	H. T. T.	R. T.	H. T. T.
0.075	0.025	56 sec.	1 min. 56 sec.	3 min. 25 sec.	4 min. 50 sec.
0.05	0.05	1 min. 6 sec.	2 min. 10 sec.	3 min. 8 sec.	5 min. 7 sec.
0.025	0.075	1 min. 14 sec.	2 min. 19 sec.	3 min. 23 sec.	5 min. 16 sec.
	0.1	3 min. 34 sec.	5 min. 51 sec.	3 min. 34 sec.	5 min. 51 sec.

Mixtures of plasma from irradiated dogs with bishydroxycoumarin (dicumarol) plasma. Plasma from irradiated dogs cannot shorten the recalcification time of dicumarol plasma as does plasma from normal dogs (table 5). This can be explained if the same factor is lowered in the two samples of plasma.

TABLE 6. *Recalcification time (R. T.) and heparin tolerance time (H. T. T.) of mixtures of plasma from normal and irradiated dogs with plasma adsorbed on barium sulfate*

Dog plasma	Barium sulfate plasma	Normal Dog		Dog 21 10 days after radiation	
		R. T.	H. T. T.	R. T.	H. T. T.
0.05	0.05	1 min. 19 sec.	2 min. 5 sec.	3 min. 56 sec.	>30 min.
0.025	0.075	1 min. 10 sec.	2 min. 25 sec.	9 min. 20 sec.	>30 min.
0.01	0.09	2 min. 20 sec.	5 min. 42 sec.	12 min.	>30 min.
	0.1	>30 min.	>30 min.	>30 min.	>30 min.

Mixtures with plasma adsorbed on barium sulfate. This experience (table 6) gives the same results as when dicumarol plasma is used.

Mixtures with serum. Addition of a small amount of normal serum greatly shortens the recalcification time of "irradiated" plasma, but serum adsorbed with $BaSO_4$ causes no shortening of these recalcification times (table 7).

The influence of vitamin K_1 was examined. This agent can increase the reduced amount of prothrombin and convertin from irradiated dogs. In our studies the quantity of vitamin K needed

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was very high, and the increase in prothrombin and convertin was rather slow. Further investigation is needed on this subject.

TABLE 7. *Recalcification times of mixtures of plasma from irradiated dogs with normal serum and serum adsorbed on barium sulfate*

Plasma dog 21 10 days after radiation	Serum	Recalcification time	
		Normal serum	Barium sulfate serum
0.075	0.025	1 min. 44 sec.	5 min. 28 sec.
0.05	0.05	1 min. 45 sec.	6 min. 35 sec.
0.025	0.075	2 min. 21 sec.	10 min.
0.01	0.09	2 min. 20 sec.	∞
	0.1	∞	∞

DISCUSSION

A series of dogs was irradiated with x-ray with doses of 400 and 600 r. No significant difference was found between these two groups of animals, and the results were given together. All the dogs who lived more than a week after the irradiation (16 of the 17 animals) showed clearly a hemorrhagic syndrome.

In this study we tried to investigate the disturbances occurring in the blood coagulation of these animals. A severe thrombopenia appeared. It seems probable however that other factors play their part in the pathogenesis of this syndrome. In other cases of severe thrombopenia, the clotting times are not greatly increased, but after irradiation, the coagulation of blood is very much delayed, and we may find blood which does not even clot at all.

A significant decrease of prothrombin and convertin concentrations in the plasma was found in a significant number of the irradiated animals.

Hypoconvertinemia, occurring in 13 dogs out of the 15, can be very severe. This insufficiency of convertin can also be deduced from the results obtained in the thromboplastin generation test. We found, in some of the dogs, a lack in thromboplastin formation which can only be compensated if serum from a normal dog is added to the mixture in which the thromboplastin formation is investigated. In this test, the serum acts as a source of the Christmas factor and of the convertin. By specific determination of this factor, we were able to demonstrate that the Christmas factor was present in a normal amount. The factor from the serum that seems

to be present in an insufficient concentration is probably convertin.

This lack of convertin can be confirmed by the results obtained in recalcification times on mixtures of plasmas.

Addition of plasma that contains convertin brings the recalcification time of a plasma sample from an irradiated dog again to normal, but addition of a convertin-poor plasma (plasma adsorbed with $BaSO_4$ or taken from a patient during bishydroxycoumarin therapy) cannot attain the same result. Normal serum, containing convertin, also brings these recalcification times back to normal, but after adsorption with $BaSO_4$ this was no longer the case.

The possibility of the presence of anticoagulants was investigated. The results with two technics of determination of the antithrombin were normal. This seems to exclude the possibility that heparin is present. Neither with the thromboplastin generation test nor with the determination of recalcification times on plasma mixtures did we find any evidence for the presence of anticoagulants.

We finally investigated the action of vitamin K_1 in bringing the amounts of prothrombin and convertin again to normal. This vitamin could produce an increase in these amounts, but further investigation is also needed here.

SUMMARY AND CONCLUSIONS

In the series of dogs irradiated with 400 and 600 r. we found severe thrombopenia. Furthermore, there was a severe lack of convertin, and to a lesser extent, lack of prothrombin in the majority of dogs. It was not possible to find facts in favor of the hypothesis that anticoagulants are present.

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COARCTATION OF THE AORTA

Report of Four Cases

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IMPROVEMENT in surgical technic, better anesthesia, and the establishment of blood vessel banks have increased the responsibility of the internist, pediatrician, and general practitioner in the early diagnosis of coarctation of the aorta. Although the surgical contraindications are being progressively narrowed, the most suitable candidate continues to be the patient in the second or third decade of life. The complication of atherosclerosis in men beyond the age of 30 years materially affects the prognosis. Because this anomaly is more common in men, an early diagnosis is extremely important.

The syndrome of coarctation of the aorta and the history of the development of definitive surgical treatment have been covered by many articles and textbooks. The interested reader is referred to recent publications of White[1] and Gross.[2]

Military medicine affords a unique opportunity for early discovery of this lesion, and cases are being diagnosed in increasing numbers in military hospitals.[3] Frequently, the only general physical examinations in early adult life for many young men are those associated with enlistment or induction into the military service.

CASE REPORTS

In a six-month period at this hospital, four cases of coarctation of the aorta were recognized. In all four instances the opportunity for discovery of this lesion had been present at an earlier date, but had been missed because of an inadequate physical examination. The first patient was hospitalized with a working diagnosis of acute meningo-encephalitis and for many days the hypertension was attributed to damage of the central nervous system. The second patient was a female dependent who was initially examined during the third trimester of a pregnancy. She was originally considered to be pre-eclamptic, and the diagnosis was made in the postpartum period when the hypertension was

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not alleviated. The third patient was an infantryman who had served two years with the Army in Korea and in whom the diagnosis was established during the physical examination incident to his release to inactive duty. The fourth patient was a 15-year-old boy who had spent his entire life under the observation of physicians, including a prolonged period of hospitalization in an institution for convalescent care of rheumatic children, without the correct diagnosis being suspected.

Case 1. A 17-year-old man was admitted to this hospital as an emergency case. He had been receiving treatment for acute pharyngitis and was under medical observation when a generalized convulsion occurred. Upon initial examination the patient was semicomatose. The eyes deviated to the upper right quadrant. A blowing, grade II systolic cardiac murmur was heard along the left sternal border, and the blood pressure was 180/104 mm. Hg. The superficial reflexes were absent and bilateral ankle clonus was observed. The deep reflexes and toe signs were normal, and nuchal rigidity was minimal.

A lumbar puncture on admission revealed clear, colorless fluid under increased pressure. The protein was 28 mg. per 100 cc. There were one polymorphonuclear cell and 10 red blood cells per cu. mm. Bacterial culture was negative. The lumbar puncture was repeated the following day with similar findings, including a spinal fluid sugar of 60 mg. per 100 cc. On admission the white cell count in the peripheral blood was 7,000 per 100 cc.; hemoglobin, 15 grams per 100 cc.

Nuchal rigidity increased during the initial 48 hours and restlessness continued. The level of consciousness gradually improved and coherent responses were obtained on the second hospital day. Serial blood pressures were consistently elevated and this was interpreted as a result of hypothalamic involvement. The patient gradually improved and was ambulatory and asymptomatic 10 days after admission. The neurologic findings were completely negative. During this period serial laboratory determinations of blood and spinal fluid were negative.

While the patient was being examined in the convalescent period, the abnormal vascular findings were first noted. The femoral, popliteal, and dorsalis pedis pulsations were absent bilaterally. Bounding pulsations in the radial and brachial arteries were noted. The blood pressure in the upper extremities was 160/115 mm. Hg; in the lower extremities it was unobtainable. The intercostal arteries were easily palpable. The previously described systolic murmur in the front part of the chest was well heard in the back along the spinous processes of the upper dorsal vertebrae, where it was heard as a grade III systolic bruit. The past history now revealed that the patient had had cramping leg pains when playing high school football.

Oscillometric determinations revealed almost total absence of pulsation in the lower extremities, and high values for the upper limbs.

The ballistocardiogram taken preoperatively revealed a total absence of the K stroke and was considered characteristic of aortic coarctation

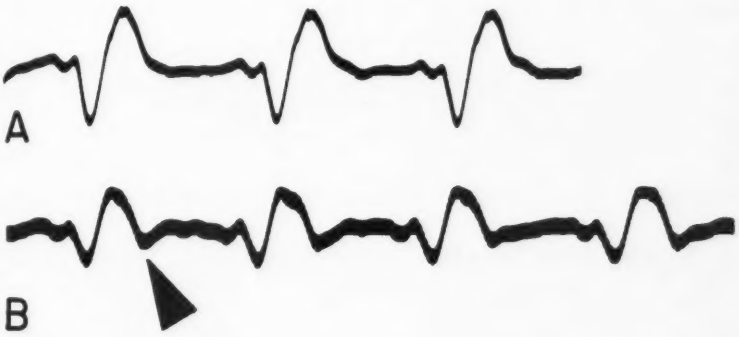

Figure 1 (case 1). (A) Preoperative ballistocardiogram showing absence of K wave. (B) Triangular arrow points out the K wave in ballistocardiogram made 10 months postoperatively.

(fig. 1A). A roentgenogram of the chest revealed the left ventricular shadow to be rounded and the aortic knob small, with notching of several rib margins (fig. 2). The electrocardiogram revealed left ventricular enlargement, and the electroencephalographic findings were within normal limits.

At operation, an area of stricture of the aorta just distal to the subclavian artery and extending about five millimeters was found. The intercostal and thoracic arteries were large and thin-walled. The ductus arteriosus was found to have a pin point lumen and was ligated and divided. The area of aortic constriction was mobilized, excised, and an end-to-end anastomosis effected. An adequate lumen, exceeding 1.5 cm. in diameter, resulted. With removal of the clamps, the aorta pulsated normally distal to the suture line.

The immediate postoperative course was uneventful. The blood pressure in the arm was 150/100 mm. Hg and in the leg, 150/95 mm. Hg. Oscillometric determinations showed a return to the normal range. Four, eight, and 10 months later he was examined. At those times he was doing well, and his exertional tolerance was excellent. Examination at four months revealed the blood pressure to be 132/90 mm. Hg in the arm, and 140/95 mm. Hg in the leg. The heart was not enlarged and no murmur was heard anteriorly. A faint systolic murmur was audible along the upper dorsal spine. The feet were warm and perspired normally. Pulsations in the lower extremities were normal. A ballistocardiogram taken 10 months following operation demonstrated a definite K wave (fig. 1B).

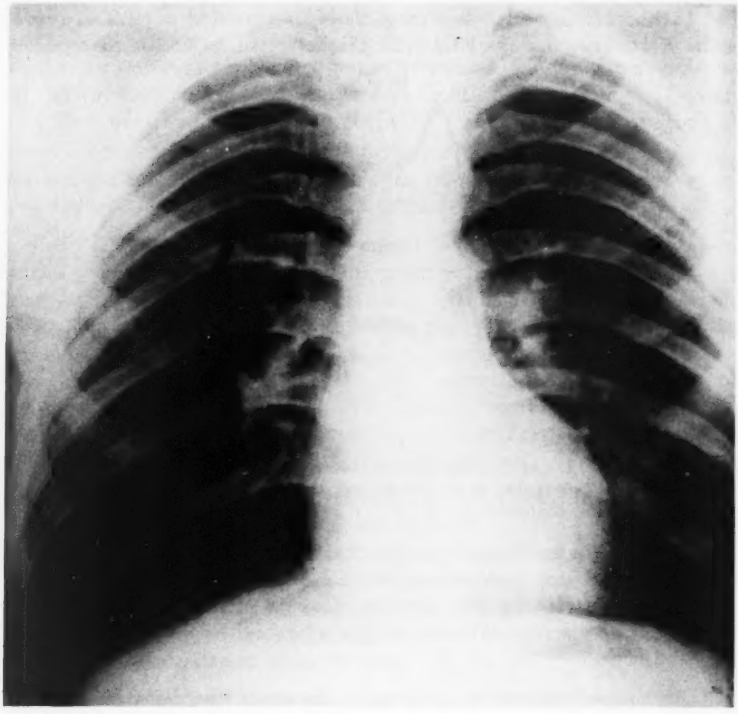

Figure 2 (case 1). Roentgenogram showing rounding of the left ventricular border, with a small aortic knob and notching of several rib margins.

Case 2. This 24-year-old woman was first examined during the eighth month of pregnancy. At that time routine examination revealed hypertension, and she was hospitalized. The pregnancy had been uneventful with the exception of occasional frontal headaches associated with blurring of vision. The past history revealed that the patient was told she had "leakage of the heart" early in her childhood, although her activity had never been restricted. Until the present examination she had not known of an elevated blood pressure. Physical examination revealed an enlarged heart. A harsh, grade IV systolic murmur was audible over the entire precordium, and was loudest at the left sternal border in the fifth intercostal space. There was no thrill and the pulmonary second sound was accentuated. A harsh systolic bruit was audible in the carotid vessels. The blood pressure in the arm was 180/92 mm. Hg. Pressure in the lower extremities was not taken.

The patient was considered to be pre-eclamptic and was treated with bed rest, magnesium sulfate, and sedation. Four days after admission, the membranes spontaneously ruptured and a double footling breech

delivery was performed. Two cords were found coming from one placenta, with the second cord leading to a lithopedion. The normal child was a male infant needing no resuscitation. The postpartum period was uneventful except for a continued elevation of blood pressure. Further examination revealed that the femoral, popliteal, and anterior tibial pulsations were markedly diminished. The blood pressure in the lower

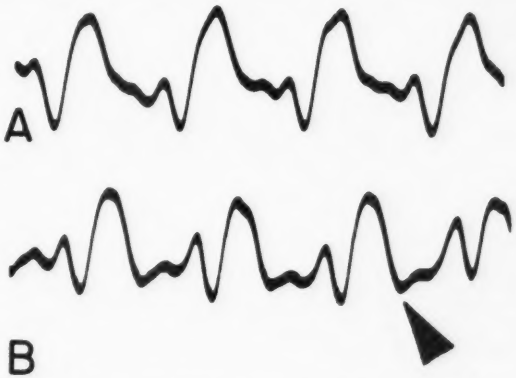

Figure 3 (case 2). (A) Preoperative ballistocardiogram showing absence of K wave. (B) Triangular arrow points out the K wave in ballistocardiogram made 17 days postoperatively.

limbs was 110/88 mm. Hg. Increased intercostal collateral circulation was noted and a systolic bruit was audible over the upper dorsal spine. A ballistocardiogram was considered diagnostic of aortic coarctation and showed a total absence of a K wave (fig. 3A). A roentgenogram of the chest (fig. 4) revealed notching of multiple ribs and a small aortic knob. The electrocardiogram showed no abnormalities.

The patient was operated on four months later. Resection of the fourth left rib exposed an adult type of coarctation of the aorta. The intercostal vessels were markedly dilated. The ductus arteriosus was patent, and was doubly ligated and divided. The aorta was mobilized and the area of constriction resected. Following re-establishment of the aortic channel, normal pulsation distal to the suture line was observed.

The patient recovered strength rapidly. When examined four months after operation her exertional tolerance was excellent. She was five months pregnant, indicating that she had been about one month pregnant at the time of operation. The blood pressure in the arm was 160/80 mm. Hg and in the leg, 160/110 mm. Hg. The heart was not enlarged and on auscultation a grade III systolic murmur was audible over the precordium. The bruit over the dorsal spine had become much softer

in intensity. A small K wave was observed in the postoperative ballistocardiogram (fig. 3B).

At term she had a normal delivery. The postpartum course was uneventful, and at discharge the blood pressure in the upper extremities was 140/68 mm. Hg.

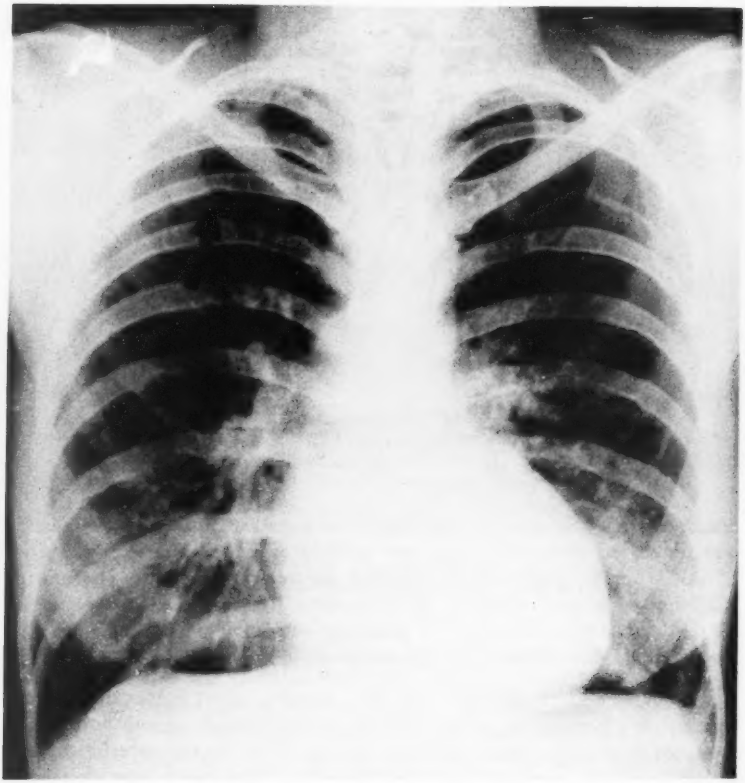

Figure 4 (case 2). Roentgenogram showing rounding of the left ventricular border, with a diminutive aortic knob and notching of several rib margins.

Case 3. This 23-year-old man was undergoing his physical examination for separation from the armed services when an elevated blood pressure was observed. In the four years antecedent to admission he had been examined on four occasions, including two examinations incident to military service. All had been considered normal. His exertional tolerance was excellent and he had served a full tour of duty with the infantry in Korea.

The blood pressure in the arm was 180/110 mm. Hg and in the leg, 95/80 mm. Hg. The radial arterial pulsation was bounding, and contrasted to the pulsations of the dorsalis pedis and anterior tibial arteries in which the pulsation was barely discernible. The heart was not enlarged and the apical thrust not increased. The first heart sound was reduplicated and the aortic second sound was of normal intensity. No murmur was audible anteriorly; however, a harsh, grade II systolic murmur was present over the upper three dorsal vertebrae. Pulsations in the intercostal arteries were prominent.

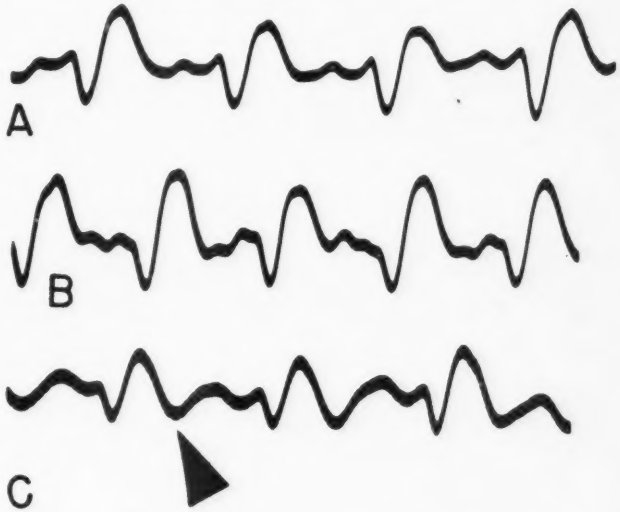

Figure 5 (case 3). (A) Preoperative ballistocardiogram showing absence of K wave. (B) Ballistocardiogram made 21 days postoperatively. (C) Triangular arrow points out the K wave in ballistocardiogram made eight months postoperatively.

The ballistocardiogram revealed no significant K wave and was considered to be indicative of aortic coarctation (fig. 5A). A roentgenogram of the chest (fig. 6) showed rounding of the contour of the left ventricle, a small aortic knob, and definite notching of several rib margins. Oscillometric studies revealed markedly decreased pulsations in both lower extremities. The electrocardiogram revealed evidence of left ventricular enlargement.

After resection of the fifth rib, a constriction of the aorta was found at the site of the ductus arteriosus and extending cephalad several millimeters. There was no pulsation of the dilated poststenotic aorta. The obliterated ductus arteriosus was ligated and divided, and the constricted area removed. Following an end-to-end anastomosis pulsations were palpable throughout the visible aorta.

The immediate postoperative course was complicated by a temporary paralysis of the left vocal cord, but was otherwise uneventful. Eight months after operation the patient appeared normal and was entirely

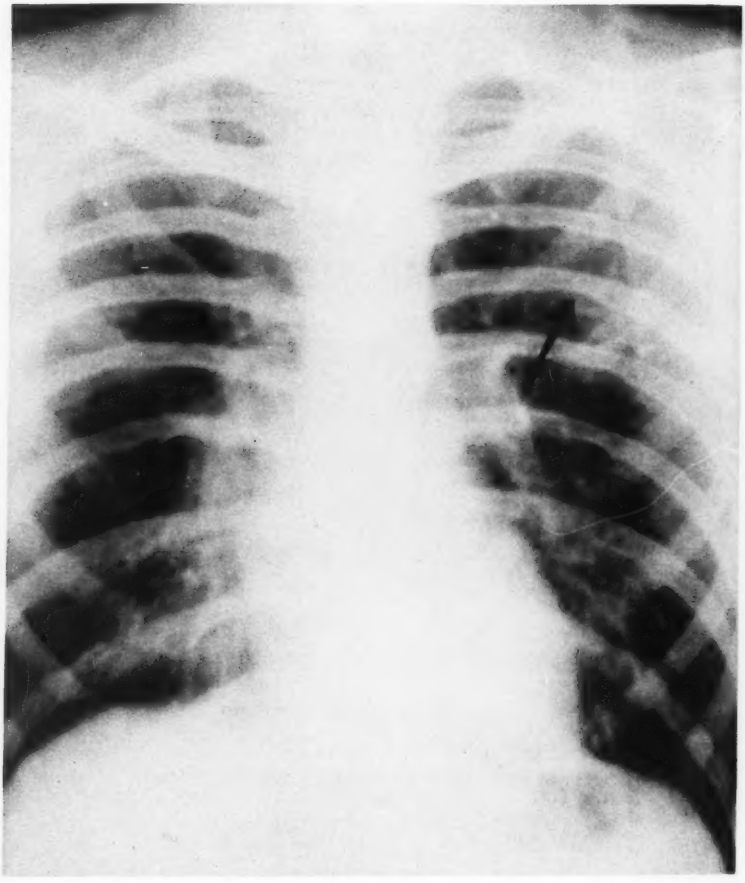

Figure 6 (case 3). Roentgenogram showing rounding of the left ventricular border, with a diminutive aortic knob and notching of several rib margins.

asymptomatic. The blood pressure in the arm was 135/85 mm. Hg and in the leg, 140/100 mm. Hg. The heart was not enlarged and no murmurs were audible either anteriorly or over the back. The electrocardiogram was normal, and ballistocardiograms taken at 21 days (fig. 5B) and eight months (fig. 5C) following operation revealed a definite K wave.

Case 4. This 15-year-old youth was initially admitted with a diagnosis of rheumatic heart disease and subacute bacterial endocarditis.

The history indicated that, after a tonsillectomy at the age of four years, the family was told that the patient had an abnormal heart. Shortly thereafter he was placed in a convalescent home for rheumatic children where he remained for two years. The blood pressure in the arm

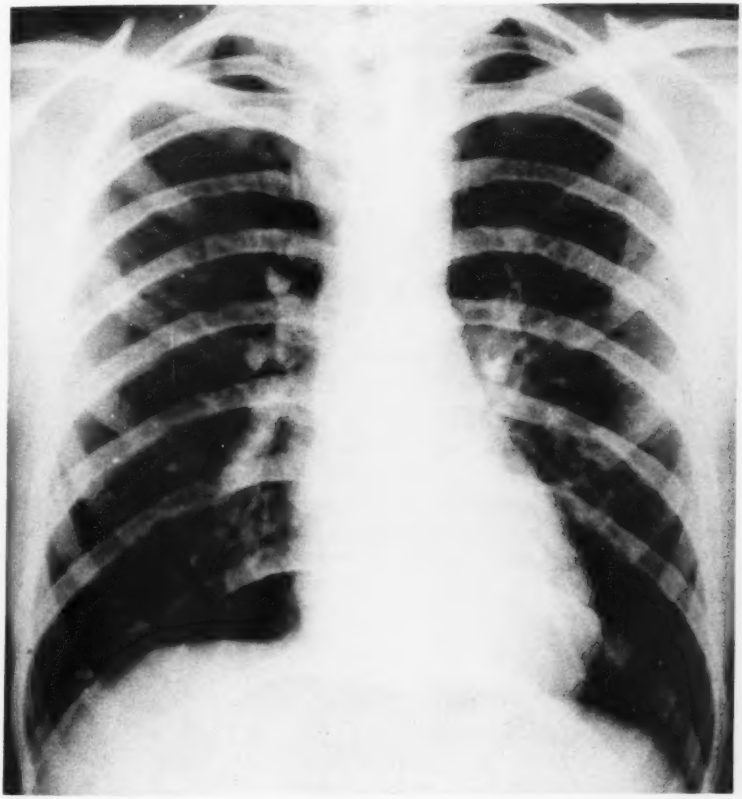

Figure 7 (case 4). Roentgenogram showing a small aortic knob and notching of rib margins.

was 170/115 mm. Hg and in the leg, unobtainable. The pulse was 96 and the temperature was 99.6° F. The heart was enlarged to the left and the apical thrust was accentuated and heaving. A systolic thrill was palpable at the apex. A harsh, grade III systolic murmur was heard all over the precordium, and was best heard in the third left intercostal space. A middiastolic rumble was audible at the apex. The pulmonary second sound was accentuated.

The patient was placed on bed rest and several blood cultures were taken. All proved to be negative. The temperature promptly returned

to normal and was not again elevated. He was given no medication. A roentgenogram of the chest (fig. 7) revealed some left ventricular enlargement, notching of multiple rib margins, and a small aortic knob. A ballistocardiogram (fig. 8) taken preoperatively failed to show a significant K wave and was considered to be compatible with aortic coarctation. Oscillometric studies revealed marked diminution of pulsations in the lower extremities. The electrocardiogram revealed left ventricular enlargement.

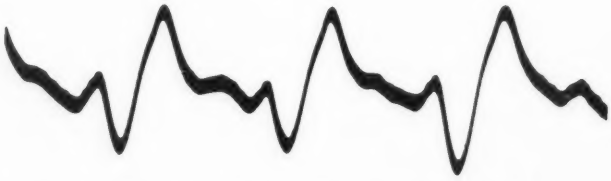

Figure 8 (case 4). Preoperative ballistocardiogram showing absence of K wave.

At operation, the left fifth rib was resected extraperitoneally. The intercostal arteries were noted to be dilated and tortuous. A marked constriction of the aorta at the level of the ductus arteriosus with slight poststenotic dilatation was exposed. Markedly decreased pulsations were present in the distal aortic segment. The ductus arteriosus was ligated and divided, following which the stenotic portion of the aorta was excised (fig. 9) and the ends approximated.

Figure 9 (case 4). Stenotic portion of the aorta excised at operation (photograph slightly enlarged).

The immediate postoperative period was uneventful. A roentgenogram taken two weeks after operation revealed the usual degree of pleural

reaction (fig. 10). The patient gained weight and was discharged to his home. One month after final discharge he returned to the hospital complaining of poor appetite, aching of his legs, and weight loss. He was febrile and obviously had lost weight. The blood pressure in the

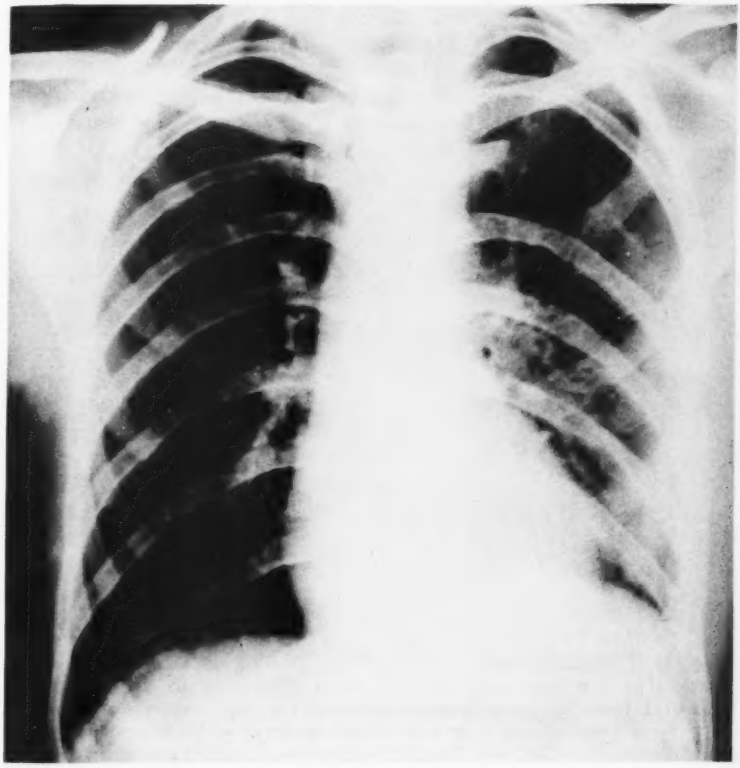

Figure 10 (case 4). Roentgenogram taken two weeks after operation revealing the usual degree of pleural reaction.

arm was 140/118 mm. Hg and in the leg, 112/70 mm. Hg. Examination of the heart revealed clinical findings similar to those in the preoperative period.

The patient developed clinical evidence of subacute bacterial endarteritis and responded poorly to massive doses of available antibiotics. In spite of repeated blood cultures both prior to and following chemotherapy, all were reported negative. The infection was controlled on 7.2 grams (12,000,000 units) of penicillin and 2 grams of streptomycin daily until a dissecting aneurysm developed at the area of the suture line (fig. 11).

The patient died eight months following his initial operation.

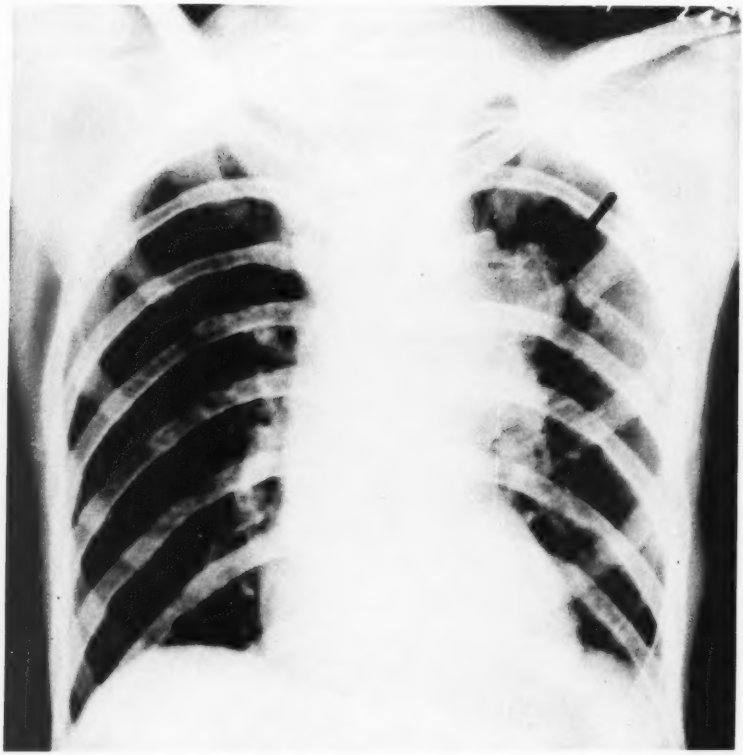

Figure 11 (case 4). Roentgenogram revealing the large aneurysmal dilatation which was proved to be a dissecting aneurysm at the suture line.

DISCUSSION

Surgical Technic. The operations performed on these four patients were essentially similar. (All operations were performed by Dr. William E. Adams of the University of Chicago, consultant thoracic surgeon at this hospital.) All the patients presented the adult type of coarctation. In each, one rib—usually the fifth, sometimes the fourth—was resected from the costal cartilage and the transverse process. The lesion was identified and the constricted portion of the aorta freed for 1.5 cm. on each side of the coarctation. The ductus arteriosus was doubly ligated and severed, as were the intercostal arteries that leave the aorta in this area. Potts' clamps were applied on each side and the constricted portion removed. An end-to-end anastomosis was made in two layers joining intima to intima. The first layer con-

sisted of three continuous mattress sutures, each going one third of the way around the vessel. The second layer consisted of three continuous running sutures (No. 00000 oiled silk) applied in the same way. The lower clamp was released first to determine if there were any leaks; then the upper clamp was removed.

The ribs were brought together and the muscles approximated by cotton sutures. A No. 12 to 14 French catheter was placed in a dependent portion so that six to 10 cm. of negative pressure of water could be used. The catheter was removed on the second or third day, and the patient allowed out of bed. Sutures were removed on the seventh or eighth day.

Diagnosis. Prior to the advent of definitive vascular surgery the improvement in the diagnosis of coarctation of the aorta was of academic interest only. The outlook for these patients was radically changed by the introduction of these surgical technics, and coarctation of the aorta now may be listed among the few forms of hypertension and of congenital heart disease that are potentially curable. Following successful resection of a narrowed aortic segment, the majority of the usual causes of death in such patients—*i. e.*, rupture of the aorta, cardiac failure, cerebral hemorrhage, or thrombosis—are made unlikely.[2,4,5] Bacterial endarteritis and cardiac insufficiency secondary to associated congenital cardiac lesions are potential complications little altered by operation.

The diagnosis still depends upon adequate physical examination. Refinements in diagnostic technic such as ballistocardiography, angiocardiography, oscillometry, et cetera, serve only to delineate the degree of aortic obstruction. Occasionally the alert roentgenologist will note rib notching and a small aortic knob, and direct attention to the correct diagnosis.

Careful examination of the peripheral vascular system is the rule in elderly patients because of the stress placed on vascular changes in diabetes mellitus and arteriosclerosis. Similarly, the pediatrician has made such an examination a routine part of the postnatal evaluation of each newborn infant. It is our purpose to stress such care in examination of the young adult of military age. The clinical picture can be variable, as illustrated by the cases presented above, but a common denominator was *decreased* arterial pressure in the lower extremities. Palpation of the peripheral arterial system in all patients must be the rule if the condition is to be recognized.

SUMMARY

In presenting the histories of four patients with coarctation of the aorta, the variability of the clinical findings is stressed.

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The abnormal physical and laboratory findings leading to the original diagnoses in three of these patients were ameliorated by surgical treatment; one patient died of subacute bacterial endarteritis and dissecting aneurysm eight months after resection.

Adequate physical examination of the peripheral vascular system is essential to the diagnosis of this condition.

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THE SCIENTIST AS A CITIZEN

We are indeed fortunate that whatever may be revealed in the field of medicine will be free for the use of all mankind, regardless of political affiliations, religious convictions, or national boundaries. Medicine does not hoard its achievements. No true physician has ever patented a medical discovery. No one has ever denied its use by friend or enemy; only armed conflict between nations with differing political beliefs has ever imposed restraints upon the results of medical investigation. Even then, the individuals who waged war, who were enemies only by accident, ministered to the sick and wounded, whether they were friend or foe . . . .

In countries outside the iron curtain, even where varying degrees of government control hover over medical practice, there are few restraints upon the individual physician who seeks truth wherever he may find it, and gives freely of his labors to mankind. The only assurance we can have that this privilege to serve will continue is an enlightened citizenry who understands the principles of individual liberty and creativeness.

Because of the intimate contact with the ills of men, physicians have gained an enviable position of respect and confidence among men. This trust obligates them to become disciples of the philosophy of individual freedom in order that patients do not become apathetic to the cause of the miracles of modern medicine.

—J. R. SCHENKEN, M. D.
in *Science,*
p. 186, Feb. 11, 1955

EVALUATION OF PSYCHIATRIC SCREENING OF ENLISTED WAVES

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THE WAVE Recruit Neuropsychiatric Unit, described in a previous report,[1] was established in November 1951 to conduct psychiatric screening as well as to supervise the mental hygiene and investigate the emotional problems of women recruits undergoing military training. Now, some three years later, it seems advisable to evaluate its effectiveness. Separate from the U. S. Naval Hospital, the unit was designed to deal only with those persons who exhibited character and behavior disorders such as pathologic personalities and immaturity reactions, and those who were unable to respond favorably to military duties. Patients with more serious emotional difficulties or with psychotic disorders were transferred to the naval hospital for medical discharge. There appeared to be a necessity for the evaluation of WAVE recruits away from their companies in a special evaluation unit. In addition, it was deemed necessary that the psychiatric standards previously set up for screening men be applied to women also. The present "Psychiatric Unit Operational Procedure Manual" reflects this and makes a provision for an observation ward for WAVE recruits.

In 1953, in summarizing the advantages of the Unit, I pointed out that through the Unit's services, "the transition between military life and return to civil life is softened to some degree, especially in Waves with a sense of failure, guilt, or shame at being found unsuitable for further military service. Severely ill recruits with suicidal tendencies, severe depressive reactions, or schizophrenic attacks are detected and hospitalized. During the period of evaluation and observation on the ward, emotional difficulties can be explored and, in some cases, brief psychotherapy may be effective in returning a recruit to duty."[1] The emphasis was on early detection and, therefore, possible prevention of serious emotional disturbances. Prompt relief from the burden of military duty was deemed to have definite therapeutic value to this end. As the discharge was for "unsuitability" under honorable conditions, it was important that only

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those considered able to return home safely be included. Those suffering from major neuroses or psychotic reactions were hospitalized.

NEED FOR OBSERVATION PERIOD

As the program progressed it soon became evident that every patient admitted was an unknown quantity and that an adequate period of evaluation, for purposes of proper disposition and to fulfill medical responsibility, was of the utmost importance. It also became apparent that, in the best interest of the recruit's health and welfare, she should be subjected to a period of close scrutiny and observation. The benefits to the Navy appear to be substantial. Of 315 recruits admitted to the Unit during 1953, 57 (18.1 percent) were returned to duty after brief psychotherapy; while 25 (7.9 percent) found to be suffering from severe clinical neuroses or psychoses were hospitalized.

We have derived a number of secondary benefits over the past two years. One is the increasing awareness of the company commanders and the officers of the WAVE Recruit Training Command of the mental hygiene facilities that are at their disposal. The emotionally maladjusted, the "problem children," and the potential offenders against military law are referred to the WAVE Recruit Neuropsychiatric Unit for study and recommendations as to disposition. The psychiatric unit, therefore, becomes closely integrated with the WAVE recruit training program. It appears that WAVE recruit training is becoming better able to remove from training those persons who find military service an intolerable emotional burden, those who become chronic disciplinary offenders, the so-called "psychosomatic cases," the accident prone, and others with evidence of emotional instability. It may be stated that disciplinary offenders may be best managed by anticipating them; that is, by studying recruits psychiatrically and determining if they are amenable to change. In this function the psychiatric unit is careful not to assume a disciplinary role. Deep-seated behavior disorders do not respond to short-term therapy, and discharge on grounds of unsuitability may be advisable.

RESULTS OF OBSERVATION

About half of all incoming WAVE recruits screened on the examining line in 1952-1953 (table 1) were placed on trial duty pending further interviews and close observation of performance. In 1952, from this "suspect" group, 287 (6.5 percent of all recruits screened) were admitted to the Unit for more detailed evaluation. This eventuated in discharge from the Navy by the Aptitude Board of 218 (4.9 percent), return to duty of 37 (0.8 percent), and transfer to a naval hospital of 18 (0.4 percent). In

1953, 315 (11.0 percent of all recruits screened) were admitted, 239 (8.4 percent) were discharged, 57 (2.0 percent) were returned to duty, and 25 (0.9 percent) were hospitalized.

The increase in the rates of admission and of discharge, it is believed, is due partly to a clearer definition of the criteria for unsuitability and partly to increased awareness throughout the WAVE recruit training command of the facilities available for the detection of unsuitability.

TABLE 1. *Disposition made of recruits screened on examining line*

	1952		1953	
	Number	Percent	Number	Percent
Total examined	4,408	100	2,855	100
Cleared for duty	2,338	53.0	1,277	44.7
Placed on trial duty	2,070	47.0	1,578	55.3

All recruits who were discharged had demonstrated sustained poor performance in training. This was a result of their having developed into certain personality types that could not adjust satisfactorily to military life. At times discharge was recommended despite motivation to continue in the WAVES, because the recruit was unable to fill a Navy billet with a reasonable chance of success. This was a move in decreasing future neuropsychiatric casualty rates. In its wider sense, the term "neuropsychiatric casualty" includes patients with psychosomatic symptoms as well as chronic disciplinary offenders, sick bay "addicts," and actual psychiatric patients. These persons offer little of a constructive nature to the functioning and efficiency of the WAVES. This latter point is adequately summarized in the following: "They contribute nothing through their own efforts, distract and hinder their shipmates, and lower the effective combat potential of the service."[2]

The alternative to removal of "unsuitable" recruits who view discharge from the service as a further failure is to retain them in the service, hoping that the Navy will be a therapeutic experience. Hunt and associates[3] offered scientifically acceptable validation for naval screening as practiced during World War II. The prediction was made that the more men who were eliminated from each recruit sample through neuropsychiatric screening, the less would be the subsequent neuropsychiatric attrition during service. The results verified the hypothesis and confirmed

the basic validity of the Naval Selection Program. In a further article by Hunt and associates,[4] the question of the borderline case was evaluated. A study was made of 537 such borderline recruits, each of whom served "successfully" for three years with subsequent honorable discharge. Nevertheless, a careful study of the medical and service records of these "borderline men" showed from four to seven times as much hospitalization and from two to six times as many major disciplinary infractions during their service as did a normal control group. In these persons, a most careful clinical evaluation is necessary for proper disposition and possible salvage.

CAUSES OF PSYCHIATRIC BREAKDOWN

While Navy life as a therapeutic experience cannot be ruled out, life experiences themselves being known as curative factors even in some clinical neuroses, it also is clear that people become ill not only because of burdens placed on them by others but because of those they place on themselves, for whatever conscious or unconscious reasons. Whenever poor performance in training or maladaptive behavior reveals that the balance of adaptation is tottering, termination of service is in the best interest of the recruit. Military life, even with some of its emotional compensations (security through obedience, dependence on authority figures, et cetera), may be compared to a rather rigidly defined system of possible responses to the frustration of inner needs and desires, both of the normal or neurotic variety. As one recruit put it: "What upsets me the most about it is that in college periodically I would stay in bed for days with my daydreams, and then suddenly all my problems would disappear and I would be all right. If we could only do that here, I would be fine." In the elastic environment of civilian life such actions are possible, and by these escape measures a person's emotional equilibrium may be maintained for years. In addition, pathologic personality types, as products of prolonged development, are not easily subject to change and do not demonstrate the flexibility of some neurotic or even transiently psychotic patients, who with brief psychotherapy could possibly fulfill their duties a great part of the time.

It is perhaps worth while to comment on the clinical picture of the diagnosis of inadequate personality, which is the second most frequent diagnosis making for discharge on grounds of unsuitability for WAVE recruits (18 percent of discharges in 1952, 30 percent in 1953). Persons with inadequate personality are described as ". . . characterized by inadequate response to intellectual, emotional, social, and physical demands. They are neither physically nor mentally grossly deficient on exami-

nation, but they do show inadaptability, ineptness, poor judgment, and social incompatibility."[5] In our experience with and study of these persons, they appear on clinical examination to be in the chronic inhibitory phase of early neurosis production. In the development of neuroses the early onslaught of fear and guilt leads to a state of inhibition, either in specific areas of functioning or in all areas of behavior (social, sexual, competitive, group membership, et cetera). This paralysis through fear is a neurotic maladaptation of instinctive "freezing," a phenomenon basic to all organisms as a passive defense against danger. If continued it may be called a chronic inhibitory state, and results in a lack of knowledge and skill in the manipulation of tasks, together with an accompanying dearth of affective responses to new tasks and past failures. This appears to be one explanation of the symptom picture of the so-called "inadequate personality."

EFFECTIVENESS OF THE PROGRAM

In order to assess the effectiveness of the WAVE Recruit Psychiatric Screening Program, a follow-up study was made of all those Waves who had been "cleared" by this facility, were allowed to graduate with their companies, and had assumed their duties in various billets in the Navy. Beginning in November 1951, all enlisted female naval personnel underwent recruit training at this naval center, so that this sample includes all incoming enlisted female naval personnel. The first 18 months of operation of the WAVE Neuropsychiatric Unit were chosen for the study, and the psychiatric casualty rate was compiled from 1 January 1952 to 31 December 1953. This period of time allowed each graduated recruit to serve for from six months to two years on actual duty in a Navy job.

An examination of the data reveals the following:

1. During the period 1 January 1952 to 30 June 1953 a total of 5,880 WAVE recruits were screened psychiatrically by the neuropsychiatric unit. Of these, 350 (6.0 percent) were discharged under honorable conditions before the completion of recruit training, by the aptitude board because of unsuitability for military service. An additional 37 (0.6 percent) were hospitalized, upon the recommendation of this Unit and the general medical dispensary, for major neuroses and psychoses. Those 'cleared" for duty by the psychiatric department numbered 5,493 (93.4 percent) of all incoming WAVE recruits. This includes those cleared on initial screening, those placed on trial duty, and those later admitted to the unit for evaluation but subsequently returned to duty.

TABLE 2. *Psychiatric illness in naval enlisted female personnel after completion of recruit training* during 1952 and 1953*

Illness	Reaction	Type of reaction	Reaction		Type		Total	
			Number	Percent	Number	Percent	Number	Percent
Psychotic	Schizophrenic		19	11.4				
		Simple			2	1.2		
		Hebephrenic			1	0.6		
		Catatonic			3	1.8		
		Paranoid			4	2.4		
		Latent			4	2.4		
		Unclassified			5	3.0		
Total							19	11.4
Psychoneurotic	Anxiety		12	7.3				
	Conversion		3	1.8				
	Obsessive-compulsive		1	0.6				
	Neurotic-depressive		5	3.0				
	Somatization (psychogenic)		5	3.0				
		Skin			1	0.6		
		Musculoskeletal			1	0.6		
		Asthenic			1	0.6		
		Other			2	1.2		
Total							26	15.7

TABLE 2. *Psychiatric illness in naval enlisted female personnel after completion of recruit training* during 1952 and 1953*—Continued

Illness	Reaction	Type of reaction	Reaction		Type		Total	
			Number	Percent	Number	Percent	Number	Percent
Character and behavior patterns	Pathologic personalities		27	16.4				
		Schizoid			14	8.5		
		Paranoid			1	0.6		
		Cyclothymic			2	1.2		
		Inadequate			9	5.5		
		Antisocial			1	0.6		
	Immaturity reactions		91	55.3				
		Emotional instability			59	35.8		
		Passive-dependent			8	4.9		
		Passive-aggressive			21	14.0		
		Aggressive			1	0.6		
Total							118	71.7
Transient personality disorders	Acute situational maladjustment		2	1.2				
Total							2	1.2
Grand total							165	100.0

*Follow-up period: six months to two years.

2. Of the 5,493 recruits who successfully completed recruit training and served for from six months to two years, 165 (3.0 percent) were subsequently discharged on the basis of neuropsychiatric conditions.

3. Of the 165 persons who became casualties in service, 43 percent had been cleared initially on the psychiatric screening line, while 57 percent had been placed on trial duty and later cleared by the psychiatric department and allowed to graduate.

4. The average length of service before illness was eight months.

5. A breakdown into nosologic groups (table 2) reveals that character and behavior patterns constituted the largest casualty group, making up 71.5 percent of the total number discharged. Psychoneurotic disorders and psychotic disorders were about the same in incidence, having been 15.7 percent and 11.5 percent, respectively. This would indicate that, in the screening of women at least, it is still the character and behavior disorders that escape the searching eye of the psychiatrist.

6. As regards over-all effectiveness, it may be stated that in the periods described above the WAVE Recruit Neuropsychiatric Unit discharged 70.1 percent of all psychiatric casualties occurring during a two-year study period. From another point of view, this survey indicates that 97.0 percent of recruits who successfully weathered the screening during recruit training were able to complete active service of six months' to two years' duration without developing psychiatric difficulties of sufficient degree to require separation from the naval service. They in all probability offered satisfactory military service and undoubtedly were themselves enriched thereby.

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SOME FACETS OF SHIPBOARD MEDICINE

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IN THE years since the outbreak of hostilities in Korea a vast number of reserve medical officers, mostly of the lower ranks, have served relatively short terms of duty aboard ships of the United States Navy. Moreover, in our policy of continuing national preparedness many more physicians inevitably will serve similar tours of duty. This experience presents the young physician with unique opportunities as well as unique responsibilities; and not always are the former fully utilized or the latter fully discharged. This fact is due largely to the medical officer's ignorance of the situation into which he enters; he is likely to try to force his new duties into the mold of his past experience, and fail to distinguish between what shipboard medicine is and what it can never be. It is the aim of this article to illuminate some of the features of this situation to the mutual advantage of future medical officers and those they serve.

When his ship is at sea, the physician can never "leave the office." He finds that he is "stuck" with a group of patients just as they are "stuck" with him. At meals he may sit next to a patient with bronchitis and be served by a patient with an ingrown toenail. The physician works, eats, relaxes, and sometimes shares a compartment with patients and potential patients. The "boss" of every enlisted man he treats is an officer in the wardroom, and the patriarch of all is the captain. In a society so structurally inbred and physically confined there is little privacy. The doctor-patient relationship in this regard is seriously distorted. This is regrettable but neither insuperable nor totally without compensation, for here is an opportunity to observe not only the importance of each seaman in the functional efficiency of the ship but also the genuine (true, occasionally officious) concern of a man for his stricken shipmate. Such a situation is rich in the nuances of interpersonal relations.

Newly assigned to his ship, the physician is amazed at the comprehensiveness of his duties. He may question that some of them are properly considered medical, for in all likelihood never before has he inspected fresh vegetables or bed linen. He finds himself without the broad base of supporting activities that in-

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auspiciously guard the public health in all but the most remote areas of the country. He becomes his own sanitary engineer and his own preventive medicine officer. This means work, some of it unpleasant. It also means a deeper understanding and appreciation of the civilian public health structure within which he may later practice.

These, then, are distinctive facets of independent shipboard medicine. Other aspects share features with other areas of medicine. They are grouped conveniently under four headings: selectivity, early diagnosis, organization, and administration.

SELECTIVITY

The prime responsibility of the physician obviously is to protect the health of the officers and men of his ship, or, in the traditional phrase of the Medical Corps, "to keep as many men at as many guns as many days as possible." Less evident is the implementation of this policy. It may be described best as the establishment of an attitude of constant alertness for the unusual while attending the ordinary.

Occasionally a medical officer may complete the morning sick call with the impression that he has seen no one who was very ill. If his initial reaction is discontent, it should be replaced by the more rational conclusions that: (1) a minority of the crew have a slight tendency toward hypochondriasis (which merits investigation), (2) the majority of the crew are healthy, and (3) the ship's program of preventive medicine has been effective. Thus, paradoxically, if his morning's practice has not been stimulating, the ship's physician has reason for self-congratulation.

One must wage a continuing, personal battle with one's tendency to dismiss minor complaints too readily—every complaint must be heard, every patient examined. An experience of mine serves as an illustration. All during a long and tedious sick call a young man was observed to be contentedly reading a comic book while guarding jealously his place at the end of the line. Finally, when he could delay his turn no longer, he indifferently offered the complaint of having "woke up with a sore in my sac." On examination this rather stoic sailor was found to have an inguinal hernia that could not be reduced .

One soon finds oneself reappraising the efficacy of standard forms of therapy as failures, partial failures, and relapses come to one's attention. For several reasons the civilian physician (to a lesser extent, the medical officer ashore) has a somewhat inflated idea of the degree to which his prescriptions and maneuvers influence disease processes. He is separated from his

convalescent patient by physical distance and inconvenience. The patient must pay to revisit him, and, if he *does* seek further medical aid, he is likely to select another physician simply *because* the original treatment was unsatisfactory. Contrariwise, aboard ship, medical care is never more than a few yards away—the patient has only to get in line; he loses work but not pay, and there is no other physician to select. The shipboard doctor finds that many therapies are more traditional than therapeutic. By way of corollary, patients with diseases primarily "psychic" too often are treated by methods primarily "somatic."

One gains an intimate acquaintance with minor diseases which occur frequently but which, because of their nature, are rarely seen in a hospital or in private practice. Plantar wart, mild conjunctivitis, molluscum contagiosum are but a few examples. Adjustment problems of adolescence are met at every turn, and there is hardly a better way to study them than to live among the maladjusted adolescents. One may become intrigued by the phenomenon of outbreaks of diseases—tenosynovitis, common sprains, and myalgia are common examples—not generally considered contagious. Listening to the complaints of young men, one is appalled at the incidence of cancerophobia. Nor can one avoid the conclusion that the inevitable partner of enlightened suspicion is fear. These observations are merely representative of the physician's "secondary gains" from his careful attention.

EARLY DIAGNOSIS

Early diagnosis is always desirable; aboard ship it is imperative. This becomes obvious if one considers the distance and the difficulties of transportation that often separate a ship from the nearest hospital. Thus, it may be imprudent to observe for more than a short time a man with low grade fever and epigastric pain, for, if the diagnosis of appendicitis is later established, the patient may still be many hours from the nearest operating room. It may be necessary to sacrifice specificity for safety, to make an early distinction between what is and will surely remain "shipboard disease" and what may be or is likely to become "hospital disease." Inevitably this policy will lead to occasional over-diagnosis. It will also result in safety, increased diagnostic awareness, and a more charitable attitude toward the frailties of the supply officer and the chief engineer.

Unfortunately too many men consult their physician too early, too late, too often, or not at all. There is no panacea, but what remedy there is consists of education of the crew and a sharpening of one's own diagnostic skill. The latter, of course, is even more important when laboratory facilities are meager.

Most patients with minor complaints who are watched carefully for the development of significant illness quickly recover without incident. Nevertheless, occasionally a patient with a headache and malaise will develop atypical pneumonia, or a patient with muscular discomfort will develop poliomyelitis. When one has observed the development of a disease from its earliest stages, one has enhanced one's understanding of the entire morbid process.

ORGANIZATION

Unlike the other services the Navy must maintain hundreds of small, mobile, often isolated medical facilities. Each department is the responsibility of a medical representative, only a few of whom are physicians. For the physician in such a situation a paradox is implicit. At sea he may be called on to perform tasks for which he is not qualified, simply because he is the *most* qualified person available. On the other hand, when in port he may deem it necessary to send a patient to a hospital not because the clinical problem exceeds his competence but because of the limitations of his sick bay.

It is important that the physician recognize this contradictory state of affairs. He must remember that he is a member of an organization primarily military, secondarily medical, that has the structure of a strict hierarchy. Under him are the enlisted medical representatives of other ships to whom he owes assistance and consultation; above him are the physicians of shore-based facilities who owe him the same allegiance. That this arrangement may at times violate his concept of ideal organization is of no importance; it is the only practicable modus operandi for naval medicine. If at times he regrets the temporary loss of stimulation from professional colleagues, he must realize that this is an inescapable consequence of being a member of a mobile unit. If at times he resents the loss of personal identification, *i. e.*, being known as "the medical officer" rather than as "Dr. Jones," he must appreciate that this is merely the result of playing a role in which there are frequent changes in cast.

From time to time the physician meets tacit expression of the all-too-human conclusion, "what is 'free' must not be worth much," and the therapeutic value of a fee becomes patent. It is distasteful to coddle (as one must) some patients, to care for them in spite of themselves; it is unpleasant to teach potential patients to expect such procedure and to disavow any responsibility for their own health. But just as shipboard life is "social," so is shipboard medicine "socialized." It cannot be otherwise. And if the doctor attempts to force his duties into the ways of private practice, he not only impairs his efficiency

but creates unnecessary difficulties. Whatever the physician's conclusions about this type of medicine, they shall represent personal experience rather than a simple parroting of the phrases of self-proclaimed experts.

What diseases the medical officer elects to treat aboard ship will depend on his training, the training of the men in his department, the facilities of his sick bay, and the location of his ship. He will discover his decisions constantly changing. Looking back with more experienced judgment, he will find that some patients were sent to a hospital unnecessarily, while other patients had been treated aboard ship with unjustifiable risk. Early in his career he will observe the need to treat ailments in the sick bay that in civilian practice he would treat at home. This is readily understandable when one considers that the enlisted man's private living space may consist of a small locker and a bunk near the overhead. Furthermore, even the simplest adjuncts to home treatment—thermometer, basin for soaks, et cetera—are not in his possession but must be obtained from or used in the sick bay. The policy of treatment of a minor illness in the sick bay is reinforced by the increase in danger of contagion as a result of the crowded condition of living quarters.

Shipboard medicine offers varying opportunities for the practice of one's specialty. At one extreme the obstetrician must content himself with activities outside his chosen specialty; at the opposite end of the spectrum the physician interested in environmental medicine encounters an unexcelled field in which to use his talents. To the recent graduate whose experience has been limited to large hospitals, duty as ship's doctor can be enlightening. He may discover that specialty X in the supervised setting of a medical center where cases are highly selected is quite different from specialty X practiced alone aboard ship at the "grass roots" level of medicine. Whatever their special interests, there are few physicians who cannot profit from the challenges that are presented daily.

ADMINISTRATION

The administrative duties of the physician are many, for he has the responsibilities of a naval officer in general and of a department head in particular in addition to those of a medical man. The conferences he attends and the directives he reads may seem tedious and even superfluous until experience demonstrates, perhaps harshly, that the business of every department is his business too. If the engineering department cannot properly distill water, if the supply department cannot properly preserve meat, the physician is quickly affected. If an open hatch is left unguarded, if paint is improperly stored, a medical disaster may occur. Each department on the ship is dependent upon

every other, an appreciation of which should increase one's determination, if not one's relish, in the discharge of administrative duties.

Medical matters blend imperceptibly with administrative matters, and it is in this area that the clinician may find himself seemingly at cross purposes with lay authority. When such a situation arises, however, it is generally more apparent than real and has its origin in the ignorance of one or both parties. For a variety of reasons one may be disinclined to explain one's decisions, but it is important to remember that the most obvious medical exigency is often obscure to the layman concerned. Viewed in the light of mutual advantage, there are few conflicts that cannot be resolved. The needs of the physician are rarely if ever contrary to the needs of the ship.

Even paper work—some of it—has its rewards. In few documents other than the Health Record can the physician find a minute account of his patient's periods of health as well as of disease, his inoculations, his blood type, his identifying marks, and his religion. Such information instantly available not only saves time but promotes accuracy. Custody and adjunction of medical records are a small price to pay for the benefits derived. Similarly, the performance of accounting procedures, in itself unpleasant, is effective in hyposensitizing the physician to his natural aversion for bookkeeping, an almost universal bête noire among physicians.

The physician lacking pedagogic talent, inclination, and experience, finds himself a teacher. His duties are two: to ensure a knowledge of first aid among the crew, and to increase the competence of the men of his department. Happily, because teaching is a method of learning, the latter aim is partially fulfilled when the hospitalmen are delegated responsibility for the crew's instruction. Beyond that, the hospitalmen's training is the duty of their medical officer. He, in turn, will profit from discussing common clinical problems and principles of treatment as he discovers scotomata of his own.

If he has had no previous military duty the shipboard doctor likely will be quite innocent of the problems and gratifications of leadership and personnel management. Perhaps in no other fields is the adage so true that "experience is the best teacher," and aboard ship is as good a place as any to gain that experience. A case in point is the omnipresent senior enlisted man who, having devoted his career to the Medical Corps, is eager to help, however subtly, the tyro medical officer with the intricacies of administration.

VOCATIONAL INTERESTS OF MEDICAL ADMINISTRATIVE OFFICERS

ANTHONY C. TUCKER, *Colonel, MSC, USA*

SINCE the establishment of the Medical Service Corps in 1947 an increasing proportion of the administrative, logistic, and tactical work of the Army Medical Service has been assigned to officers of that corps. This trend will probably continue, primarily because of the emphasis on using physicians for professional duties. The effectiveness of these Medical Service Corps administrative officers is, therefore, closely related to the ability of the Army Medical Service to carry out its mission.

There has now been sufficient experience at all echelons to warrant making studies of the characteristics of effective officers in these assignments. The results of such studies should be helpful in career guidance and in making assignments. This study is concerned with only one aspect of the personal qualities of these officers, namely, their vocational interests. Before considering any results the device which was used to measure these vocational interests will be discussed briefly.

THE STRONG VOCATIONAL INTEREST BLANK

The Strong vocational interest blank[1] has been used for over 25 years to measure the degree to which a man's interests correspond with those of successful men in certain selected occupations. Interests, as measured by this method, appear to be permanent during the period of a man's life covered by a military career. There is also substantial evidence that men do tend to enter, and to remain in, occupations for which their own interest scores were high. That is, the scores obtained by those completing this blank appear to predict job-satisfaction and willingness to continue in a certain line of work.

This score does not measure ability or aptitude but rather the likes and dislikes of a large number of everyday items. Any use of these scores for career guidance should be supplemented by evidence of the man's ability to perform on the particular job.

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The Strong vocational interest blank is scored on 45 occupational scales. The results are reported as standard scores which were established for each scale by setting the mean raw score of the group on which the scale was standardized equal to 50 and the standard deviation equal to 10. Letter ratings from A to C are also used to indicate degree of interest. An A rating corresponds to standard scores of 45 and above; a B plus rating, to scores of 40-44; a B rating, to 35-39; a B minus, to 30-34; and a C rating includes scores of 29 and below.

In understanding the meaning of scores on these scales it may be helpful to consider what proportion of a standardization group would probably receive each rating. For example, it would be expected that the scores made by physicians on the Physician Scale would be distributed approximately as follows: A (45 and over) 70 percent; B plus (40-45) 15 percent; B (35-39) 9 percent; B minus (30-34) 4 percent; and C (29 and below) 2 percent.

For the person completing the blank, an A rating can be considered to mean that he has the interests characteristic of men successfully engaged in that occupation. With a B plus rating he has less assurance that he has such interests. Ratings of B and B minus should raise serious doubts as to whether or not he has these interests. A rating of C indicates he does not have the interests of men in that occupation.

300 OFFICERS STUDIED

The group of Medical Service Corps officers selected for study consisted of 300 Regular Army officers who had performed satisfactorily in administrative assignments for at least five years. A total of 280 of these officers completed the Strong vocational interest blank and were sent a report of their own scores on the 45 occupational scales.

Table 1 shows the average scores for the Medical Service Corps administrative officers on each of the 45 occupational scales. It is readily apparent that these officers do not have interests similar to physicians, nor to any of the scientific professions as indicated by the scores on the first 12 scales. These officers as a group also definitely do not have the interests of the following occupational groups (mean score 29 or less): carpenter, city school superintendent, minister, musician, certified public accountant partner, advertising man, lawyer, or author-journalist.

More important in describing the vocational interests of this group are the occupational scales on which they obtained high scores. There are seven scales on which these Medical Service Corps administrative officers had average scores of 40 or higher, namely: production manager, army officer, personnel manager, public administrator, senior certified public accountant, junior

accountant, and office worker. In these occupations the average Medical Service Corps administrative officer would probably find men who are interested in the same things that interest him.

TABLE 1. *Mean scores of 280 Medical Service Corps administrative officers*

Scale	Mean	Scale	Mean
Artist	13	Public administrator*	47
Psychologist	23	Vocational counselor	39
Architect	16	YMCA secretary	31
Physician	25	Social science teacher	37
Psychiatrist	28	City school superintendent	29
Osteopath	32	Minister	20
Dentist	21	Musician	21
Veterinarian	25	Certified public accountant partner	27
Physicist	9	Senior certified public accountant *	42
Chemist	22	Junior accountant*	40
Mathematician	13	Office worker*	44
Engineer	27	Purchasing agent	39
Production manager*	41	Banker	36
Farmer	34	Mortician	36
Carpenter	23	Pharmacist	34
Printer	32	Sales manager	37
Mathematics-science teacher	36	Real estate salesman	36
Policeman	39	Life insurance salesman	33
Forest service	32	Advertising man	29
Army officer*	41	Lawyer	28
Aviator	34	Author-journalist	24
YMCA physical director	35	President	31
Personnel manager*	41		

(Standard deviations approximate 10)
*Scales with mean scores of 40 or over.

To sum up, the picture we get of the average Medical Service Corps administrative officer in this group is that he has many interests in common with men in the managerial, administrative, personnel, and accounting fields and that he has interests in common with other Army officers. His interests are strikingly different from those of physicians and men in other scientific professions.

Based on each officer's military occupational specialty it was possible to place him in one of four groups according to his pres-

ent primary duty: (1) general administrative, (2) supply, (3) personnel, and (4) staff officer in higher headquarters. The mean scores of these groups on each of the seven occupational scales on which these officers had high average scores are shown in

TABLE 2. *Mean occupational scale scores by type of duty*

Scale	General administrative	Supply	Personnel	Staff officer in higher headquarters
	N*=110	N=86	N=43	N=41
Production manager	41	43	39	41
Army officer	40	41	41	41
Personnel manager	42	40	42	42
Public administrator	47	47	48	48
Senior certified public accountant	42	43	41	43
Junior accountant	39	41	39	40
Office worker	43	44	45	44

(Standard deviations approximate 10)
*N= number of men completing test.

table 2. The supply group tends to be higher on the production manager scale and the personnel group tends to be slightly higher on the personnel manager scale. However, the differences are all small and it appears reasonable to assume that administrative officers in different assignments have about the same vocational interests.

TABLE 3. *Mean occupational scale scores by rank*

Scale	Captain	Major	Lt. Colonel	Colonel
	N*=41	N=99	N=124	N=16
Production manager	43	43	40	39
Army officer	44	42	40	30
Personnel manager	42	42	41	36
Public administrator	48	47	48	43
Senior certified public accountant	44	43	42	37
Junior accountant	39	40	40	36
Office worker	43	44	44	41

(Standard deviations approximate 10)
*N=number of men completing test.

In table 3, mean scores on these seven occupational scales are shown for the officers grouped by rank. In this table the differences are negligible until the colonel group is reached. There are many possible explanations of the lower mean scores of the colonel group. With only 16 officers in this group these mean scores are not very reliable. This study does not supply enough information to explain these low scores.

TABLE 4. *Distribution of scores on three occupational scales*

Letter rating	Medical Service Corps administrative officers	Army command and staff medical officers	Physicians in general
	N*=280	N=67	N=100
	Public Administrator Scale		
	Percent	Percent	Percent
A	63	58	21
B+	18	21	16
B	12	14	18
B–	5	6	26
C	2	1	19
	Personnel Manager Scale		
	Percent	Percent	Percent
A	40	40	5
B+	16	21	8
B	18	1	17
B–	14	17	10
C	12	21	60
	Physician Scale		
	Percent	Percent	Percent
A	3	27	73
B+	6	6	11
B	12	18	8
B–	13	13	5
C	66	36	3

*N=number of men completing test.

In a previous study[2] scores on certain occupational scales were obtained for two other groups which may be of interest in the pres-

ent study. A group of medical officers doing command and staff duties was selected by the Surgeon General of the Army to represent Medical Corps officers who are primarily performing these duties rather than dealing directly with the care of the sick. A physicians-in-general group was selected to represent all practicing physicians in this country.

In table 4 the Medical Service Corps group, the army command and staff medical group, and the physicians-in-general group are compared on three occupational scales. The percentage of each group obtaining each letter rating on each scale is shown. For example, on the public administrator scale, 63 percent of the Medical Service Corps officers obtained scores of 45 or over, that is, an A rating; 18 percent scored 40-44, that is, a B plus rating; et cetera.

It is apparent from table 4 that the scores of army command and staff medical officers on the public administrator and personnel manager scales are much more similar to the Medical Service Corps administrative officer group than to the physicians-in-general group. Even on the physician scale these Medical Corps officers are very different from the physicians-in-general group. In other words, it appears that many of the interests of the Medical Service Corps administrative officers are very similar to those of the Medical Corps officers doing command and staff work, but are quite different from those of the average physician.

SUMMARY

Strong vocational interest blanks were completed by 280 Medical Service Corps officers of the Regular Army with at least five years' experience in administrative assignments. The results indicate that the following statements can be made about these officers: (1) Their interests are similar to those of men in the administrative occupations and to other Army officers; (2) their interests are strikingly different from those of physicians and men in other scientific professions; and (3) their interests are somewhat similar to Medical Corps officers in command and staff assignments.

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HELICOPTER EVACUATION IN KOREA

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HELICOPTER evacuation, as much as any other single factor, was responsible for the reduction of mortality among the wounded in Korea to the phenomenal figure of only 2.4 percent, the lowest of any major military campaign to date. Actually, the concept of utilizing rotary wing aircraft for the evacuation of seriously wounded casualties is not a new one. In 1936, at the Medical Field Service School, Carlisle Barracks, Pa., an autogyro was field-tested as an evacuation vehicle. The idea was discarded at that time for engineering and budgetary reasons more than any defect in the basic concept. During World War II the Air Force and Navy began to use helicopters for the rescue of pilots and other personnel lost at sea or in inaccessible terrain. This innovation was further developed during the interim period between World War II and the Korean incident.

It was in Korea, however, that helicopter evacuation became a reality. This final fulfillment of an old concept of the Army Medical Service had to wait for two developments. The first was the acceptance of the helicopter as an organic vehicle of the Army, and the second was the need for such an aircraft to surmount the many difficulties unique to the geography of Korea. The first problem was mastered by helicopter manufacturers and far-sighted logistical agencies in time to answer the requirements established in Korea.

It is advantageous to examine briefly the evolution of helicopter evacuation in Korea, with particular emphasis on medical lessons learned. Inasmuch as Korea represents the only large-scale, field test of helicopter evacuation under combat conditions, it should indicate trends of value to the Army Medical Service in the development of organization doctrine and procedures for the future. The clinical aspects of helicopter evacuation have been presented in a previous report.[1]

THE BEGINNING IN 1950

Helicopter evacuation in Korea was not the result of any preconceived plan; it was the result of expediency. In the early

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days of the Korean conflict, a helicopter detachment of the Third Air Rescue Squadron began to receive requests from ground elements for the evacuation of casualties from difficult terrain. Inasmuch as this detachment was not fully occupied with its primary mission of rescuing pilots downed over water or behind enemy lines, it responded to these calls. By August 1950, this United States Air Force unit was answering so many calls that it found itself in the medical evacuation business.

Quick to note the advantages of helicopter evacuation in terrain such as Korea, the Eighth Army developed an increased interest in the program. During a significant test conducted by Army and Air Force representatives on 3 August 1950 in the school yard of the Taegu Teachers College, Army helicopters were adopted for the evacuation of casualties and the first procedures were established. On 22 November 1950 the Second Helicopter Detachment arrived in Korea. This unit, equipped with four H-13 aircraft and initially assigned to the 47th Light Aviation Maintenance Company, spent the remainder of the year in an intensive training program.

DEVELOPMENTS IN 1951

Army helicopter evacuation was officially established on 1 January 1951 when the Second Helicopter Detachment became operational and was attached to the 8055th Mobile Army Surgical Hospital. In January 1951, two more helicopter detachments, the Third and Fourth, arrived in Korea with minimum operating personnel and four H-13 aircraft, followed in February by the First Helicopter Detachment. At this time all helicopter detachments used in medical evacuation were assigned to the 8085th Army Unit, Eighth Army Flight Detachment, and attached to forward surgical hospitals.

The early days of the helicopter evacuation detachments were very stormy, reflecting the chaos in Korea in the first part of 1951. The Fourth Helicopter Detachment, attached to the First MASH, suffered a complete breakdown of all its aircraft and had to be returned to a rear area for re-equipping. It did not become operational until 9 March 1951. The First Helicopter Detachment, which arrived in Korea in late February, was stripped of its four H-13 aircraft in March because of more critical operational requirements. Two weeks later it was given two replacement H-23 models, but the next day had to lend one to an engineer group. When this aircraft was returned in April, it was immediately sent to an ordnance aircraft maintenance battalion, and the second aircraft transferred to the Korean Military Advisory Group. This detachment, although operational under the Eighth Army Flight Detachment, had still flown no combat evacuation missions.

The three operational detachments, despite recurring maintenance problems involving faulty cooling fans, tail rotor cables, spark plugs, transmissions, and bearings; shortages of high octane fuel; and inadequacy of spare parts, performed their mission exceptionally well. With a total of only 11 aircraft they evacuated 1,985 patients during the first six months of 1951. These detachments contained only minimum pilots and supporting personnel, and there was wide variation in their organization. The impressive record of these detachments, despite their many difficulties, is a tribute to the officers and men who staffed them.

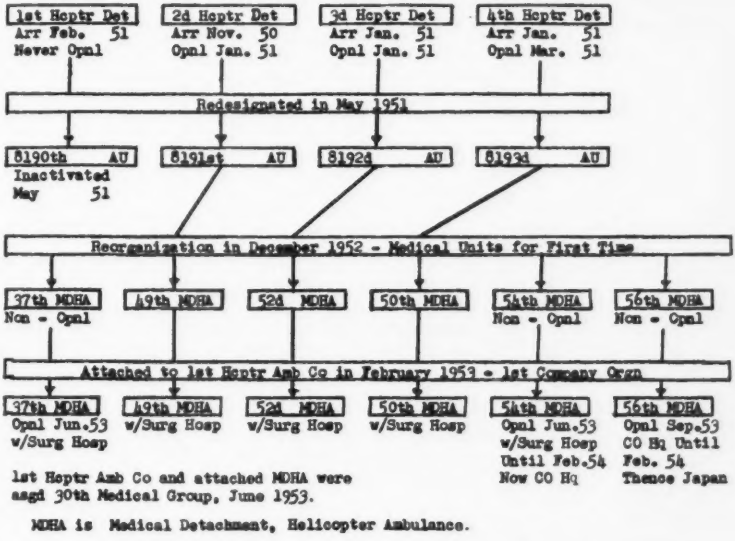

Figure 1. Genealogy of medical helicopter units in Korea.

On 14 May 1951, all helicopter detachments were redesignated as army units (AU). Figure 1 reflects the genealogy of medical helicopter units in Korea. The First Helicopter Detachment (or 8190th AU), which still had not flown a combat evacuation mission, became nonoperational on 14 May 1951, and its personnel and equipment were transferred to the three operational detachments. In the early months of 1951, the fluid main line of resistance (MLR) required frequent displacement of the mobile army surgical hospitals and their attached helicopter units. With the partial stabilization of the MLR in mid-1951, the hospitals with their helicopter units settled into more permanent positions. Despite all the difficulties encountered, the three operational detachments evacuated 5,040 casualties during the first 12 months of operation, logging a total of 4,421 hours of flying time.

Table 1 is a recapitulation of the evacuation record during 1951, by unit and by month.

TABLE 1. *Medical helicopter evacuation in Korea, 1951*

Month	2d Helicopter Detachment 8191 AU	3d Helicopter Detachment 8192 AU	4th Helicopter Detachment 8193 AU	Total
January	60	10	--	70
February	173	42	20	235
March	210	161	100	471
April	169	46	208	423
May	111	66	275	452
June	101	78	155	334
July	72	79	75	226
August	166	234	82	482
September	224	309	139	672
October	221	477	429	1127
November	67	166	86	319
December	87	69	73	229
Total	1661	1737	1642	5040

ORGANIZATION DURING 1952

Tables of Organization and Equipment (T/O&E) 8-500, dated 25 August 1952, established the "helicopter ambulance unit." On 2 December 1952, the provisions of this new T/O&E were implemented within the Eighth Army. On that date the Army units representing helicopter evacuation detachments were inactivated, and from their personnel and equipment were established the 49th, 50th, and 52d Medical Detachments, Helicopter Ambulance. Until that date all helicopter evacuation units had been assigned to the 8085th AU, Eighth Army Flight Detachment, and attached to mobile army surgical hospitals. Subsequent to that date, helicopter evacuation elements were under the administrative as well as operational control of the Eighth Army surgeon. The medical helicopter ambulance detachments were recognized as medical units—a goal that had long been set by the Army Medical Service.

PROGRESS IN 1953

Since the outset of the Korean campaign, the inadequacy of the cellular organization of helicopter evacuation units has been recognized. Many of the early problems of these units can be traced to a lack of centralized control and unnecessary duplication of effort. On 3 February 1953, the First Helicopter Ambulance Company (Provisional) was organized, and the scattered, small, cellular detachments were welded into an integrated, smoothly functioning team. The company initially consisted of

the three operational detachments, plus the newly activated 37th Medical Detachment, Helicopter Ambulance.

TABLE 2. *Medical helicopter evacuation in Korea, 1952-1953 (combat)*

Month	1952	1953
January	516	345
February	314	281
March	332	374
April	376	516
May	639	721
June	915	1273
July	945	1225
August	737	--
September	892	--
October	910	--
November	825	--
December	522	--
Total	7923	4735

On 1 June 1953, the First Helicopter Ambulance Company (Provisional) was assigned to the 30th Medical Group, the agency responsible for all evacuation within Eighth Army. Subsequent to this assignment, two additional helicopter ambulance detachments, the 54th and 56th, were organized. These latter two units were not operational during the period of hostilities. On 29 August 1953, the first five Medical Service Corps pilots reported in Korea and were assigned to the First Helicopter Ambulance Company. Prior to that time all medical helicopters had been flown by Armor Artillery, Infantry, Engineer, and Signal Corps officers. The capabilities of these line officers in their role as medical evacuation pilots is reflected in table 2 which recapitulates the evacuation record by month for 1952 and the first seven months of 1953. As more Medical Service Corps pilots became available, line officers were released to their parent branches of the service.

Though the combat evacuation mission was completed with the cessation of hostilities, emphasis was shifted to the evacuation of seriously ill and injured patients. During the peak of hemorrhagic fever incidence, the atraumatic nature of helicopter evacuation was clearly demonstrated. Casualties brought to the special treatment center by helicopter presented a greatly reduced morbidity and mortality rate. The ready availability of helicopter transportation permitted the economical storage of whole blood at the army medical depot and its forward medical supply points. When required, blood could be moved rapidly to forward treatment facilities. Both medical and transportation

helicopter units were used extensively during the exchange of prisoners of war. Medical helicopters proved very effective in the movement of patients between army medical installations and the U. S. Navy hospital ship offshore.

THE SITUATION IN 1954

The 56th Helicopter Ambulance Detachment was transferred to Japan on 1 February 1954. Only troop spaces needed for the establishment of a special aviation school were transferred; personnel and equipment were not moved from Korea. The 54th Helicopter Ambulance Detachment, based at Headquarters 30th Medical Group, provided the overhead for the provisional company organization. This unit also was responsible for air evacuation to the rear of the forward surgical hospitals, furnished the 30th Medical Group and Eighth Army medical section with aviation staff support, and field-tested certain items of auxiliary helicopter equipment. The remaining four helicopter ambulance detachments were located at the four operational surgical hospitals.

Helicopter ambulance detachments are Army Medical Service units, assigned to the 30th Medical Group, attached to the First Helicopter Ambulance Company, based on compounds of surgical hospitals and under the dispatch control of corps or senior area surgeons. While this organizational structure may appear complicated, it proved most effective in Korea. With one exception, all pilots in the First Helicopter Ambulance Company were Medical Service Corps officers. The exception, an artillery captain and the company commander, has been retained due to his experience and his value as a staff advisor in the tactical aspects of the helicopter evacuation program.

In the early months of 1954 the shortage of officers of the Medical Corps became acute in Eighth Army, requiring the closing of certain medical treatment facilities and consolidation of others. Increased emphasis was placed on bringing the patient to the doctor. Medical helicopters with qualified Medical Service Corps pilots again demonstrated their worth. Now it was practical to pick up injured personnel at the scene of accidents and bring them rapidly to the proper medical treatment facility. The medical training of the Medical Service Corps pilots, supplemented by additional instruction in Korea, enabled them to give effective first aid prior to evacuating patients to a facility staffed with a physician.

SUPPLEMENTAL EVACUATION

While it is accepted that forward helicopter evacuation is the mission of the Army Medical Service, the contribution of other aviation agencies cannot be over-emphasized. Auxiliary support

by the U. S. Air Force, Marines, and Army Transportation Corps, increased both the flexibility and over-all potential of helicopter evacuation. Helicopters organic to major tactical commands were also used from time to time for evacuation within division areas. Throughout the hostilities, and during the subsequent interim period, the Marine Corps maintained the capability of evacuating their own casualties to either a Navy hospital ship or supporting Army medical installations.

Specially equipped cargo helicopters of the Air Force proved invaluable in the pickup of patients from isolated areas, particularly when over-water flights were involved. Improved navigational instruments, flotation gear, and other impedimenta not available to the Army Medical Service enabled the Air Force to accomplish such missions with greater speed and a greater margin of safety. In each case evacuation requests were received and processed by the Army Medical Service, and those beyond the capability of currently available helicopters were referred to the appropriate supporting agency for execution. This helicopter evacuation team, under the guidance of the Army Medical Service, proved most effective and is a prime example of interservice co-operation.

Of particular value was the contribution of the Army Transportation Corps. While the mission of its helicopter elements is stated as ". . . to provide short-haul air transport to expedite tactical operations and logistical support in forward areas of combat zones," these units accomplished an additional air evacuation mission. In the closing five months of the war, one Transportation Corps helicopter company, equipped with H-19 aircraft, evacuated a total of 701 casualties. Another, in action only two months, evacuated a total of 1,547 patients. During one particularly heavy period of combat in an inaccessible area, this company evacuated 723 patients in one three-day period, moving 301 patients in a single day. The greater capacity of the H-19 aircraft make them particularly effective in convoy or mass evacuation. This auxiliary form of helicopter evacuation will prove invaluable in the future.

PRINCIPLES ESTABLISHED

The experiences gained in Korea cannot be denied. It proved to be the testing ground of many new logistical concepts and procedures. One of the foremost was the evacuation of casualties from forward combat areas by helicopter. While the limitations imposed by the Korean conflict must be accepted, experiences documented here and in other articles must be critically reviewed with an eye to the future. The following lessons have been learned concerning helicopter evacuation:

Organization. Observers in Korea were convinced that helicopter evacuation within the combat zone is the responsibility of the Army Medical Service. Supplemental evacuation by other aviation agencies should be provided as available and as required and requested by the Army Medical Service. One agency, within the Army, must be responsible for evacuation within the combat zone if confusion and duplication of effort is to be avoided.

The company-type organization for helicopter ambulance elements is superior to the small cellular detachments provided in T/O&E 8-500. Helicopter units, whether company or detachment size, should remain under the control of the field army or a centralized medical command should one be available. The inherent speed, range, and flexibility of ambulance helicopters dictate against their assignment to subordinate major commands.

Using the First Helicopter Ambulance Company as a prototype, a T/O&E for a helicopter ambulance company has been prepared, staffed, and submitted. This company, allocated to field army on a basis of one per corps, will consist of three forward evacuation platoons, each containing four reconnaissance helicopters of the H-13 type plus minimum operating and supporting personnel. A fourth, or support, platoon, equipped with utility helicopters of the H-19 type, will provide selective evacuation between forward medical installations and supporting special treatment facilities. Administrative and maintenance functions will be consolidated in the company headquarters. The proposed organization will improve both the efficiency and effectiveness of forward air evacuation.

Control. Long a basic principle of medical service, control is particularly important in helicopter evacuation. Integration of the evacuation and treatment components of the field army's medical service is essential. Helicopter evacuation units should remain assigned to field army or an appropriate central medical command headquarters. In the "type" situation, the dispatch of individual helicopter evacuation sorties should be the responsibility and function of the corps surgeon who is at a sufficiently high level to determine realistic priorities, yet close enough to the scene of action to keep abreast of the immediate situation. In unusual situations, helicopter evacuation elements may be decentralized to the control of subordinate surgeons as any other form of logistical support is decentralized. As soon as possible, however, control should be regained by the highest command level capable of accomplishing the evacuation mission.

Only Army Medical Service agencies should accept evacuation requests. Command surgeons alone know the status of medical treatment facilities, such as surgical lags, location of special treatment teams, and projected displacements of medical installations. Requests which exceed the capabilities of the medical service can then be referred to the appropriate supporting helicopter element for execution. This system, proved in Korea, ensures integration of evacuation and treatment elements and eliminates the confusion which accompanies division of responsibility.

Communications. No separate communications net is required to control helicopter evacuation. It is feasible and desirable to process evacuation request through medical channels over "common user" facilities to that surgeon possessing dispatch control over supporting helicopter evacuation units. The present system is economical, and ensures integration of helicopter evacuation with tactical operations in forward areas. Air-ground radio communications between medical helicopters and forward medical installations were never used in Korea. Reliance was placed on accurate reporting of pickup locations, and visual air-ground communications of panels and smoke. This procedure is sound. The large area over which helicopter units are capable of operating, and mechanical limitations in available radios, make it undesirable to depend on air-ground electronic communications. Weight limitations dictate against providing several types of radio equipment in the evacuation helicopter. Airborne radio sets should be netted with appropriate Air Force agencies and fire support coordinating centers to provide control of aircraft in flight.

Personnel. Helicopter pilots, particularly those flying reconnaissance type helicopters engaged in battle field pickups, should be officers of the Medical Service. On occasion, they will be required to administer first aid at the site of pickup prior to movement of the patient. In all cases, though they are incapable of administering treatment in flight, they must possess sufficient medical training and experience to make sudden decisions regarding the destination of patients. Medical Service pilots should receive greater consideration in the development of career patterns. Assignments are presently limited, and no progression is ensured.

Greater emphasis should be placed in integrating medical service pilots into the over-all effort of the Army Medical Service. There has been a tendency to feel allegiance to the nonexistent "Corps of Army Aviation" rather than to the Army Medical Service. Pilots must be provided with an opportunity to

develop in the normal functions of their corps and to assume normal medical service responsibilities. Recently, several experienced pilots were given full responsibility for staff positions in hospitals and various medical command headquarters. The importance of this program cannot be overly emphasized and must be continued. If these principles of personnel management are ignored, the Army Medical Service will, in effect, lose some of its most capable junior officers.

Aircraft. The most maligned evacuation vehicle in the Army Medical Service is the H-13 aircraft. There is a great discrepancy between the opinions of those at research and development level and those at the operating field level. Those responsible for the development of evacuation aircraft believe that all such aircraft should be capable of transporting patients internally. Observers in the field are convinced of the superiority of the present reconnaissance helicopter with patients transported externally on litter racks. Actually, both are required.* The larger aircraft of the H-19 and H-25 type will never replace the smaller H-13 for forward "battlefield" pickups. Their greater cost, larger silhouette, increased loading and unloading times, all dictate against their utilization in the division area. Tactical commanders, responsible for their mission as well as for the lives of many men will be hesitant to clear the landing of a larger helicopter in their area when they would permit the landing of the small reconnaissance type.

It is uneconomical and unnecessary to provide the Army Medical Service with enough aircraft of the various types to accomplish the entire medical evacuation mission on a unilateral basis. Situations requiring mass evacuation (*i. e.*, to empty a hospital for displacement or in connection with area damage control operations) can be met by requesting supplemental evacuation support from the Transportation Corps or other available aviation agency. The Medical Service has long depended upon the Transportation Corps to operate its ambulance trains and the Air Force to provide high-performance, long-range aircraft. This concept is also valid in helicopter evacuation operations.

Many observers in Korea have expressed the belief that there is no requirement at the present for incorporating fixed-wing aircraft in Army Medical Service air evacuation units.** The advantages of the greater speed, longer range, and lowered main-

*Current developments envision that a two-litter, internal-carry, utility helicopter, of no greater over-all size than the present reconnaissance helicopter will soon be produced. The present H-19 is only an interim utility helicopter and the H-25 is only a training helicopter.—*Editor*

**The Surgeon General, Department of the Army, is conducting testing to determine feasibility of fixed-wing Army aircraft for medical missions as well as studying the over-all forward air evacuation system.—*Editor*

tenance problems inherent to fixed-wing aircraft are offset by certain disadvantages. These include the maintenance problems incident to providing three instead of two aircraft for the Medical Service, the necessity for considerable additional training for Army Medical Service pilots (now qualified in rotary wing aircraft only), and the requirement for improved airstrips for medical evacuation.

In the forward combat area, of primary concern is the elapsed time from wounding to initial definitive surgery. While fixed-wing aircraft are faster when airborne, the necessity for surface evacuation between airfields and medical facilities plus the duplication of handling patients detract from any apparent advantage of speed. For longer evacuation flights, not feasible for helicopters, fixed-wing aircraft of the Air Force and other Army aviation agencies are available. The primary requirement for fixed-wing aircraft within Army medical units at present is for the control of helicopter elements. The necessary command and liaison visits, the distribution of critical spare parts, and the aerial resupply of whole blood entail missions which would be favored by organic fixed-wing aircraft. However, these requirements are currently satisfied by requesting supplemental aviation support.

The flexibility of medical evacuation can be improved by the provision of certain auxiliary equipment for both reconnaissance and utility-type helicopter. Flotation gear is required if the Army Medical Service is to accomplish its accepted mission of evacuation anywhere within the army area, including adjacent offshore waters. The H-13 aircraft requires additional instruments to enable it safely to accomplish night missions and those flown under marginal weather conditions. It is not necessary that complete navigation instruments be provided because the accompanying loss in allowable cargo load and the requirement for a copilot will offset any advantages accruing therefrom. The Air Force with its specially equipped air rescue helicopters can execute such occasional missions as may exceed the capabilities of aircraft of the Army Medical Service.

SUMMARY

In a brief account of the evolution of medical helicopter evacuation in Korea, emphasis has been put on the principles developed and lessons learned. The progressive assumption by the Army Medical Service of its forward air evacuation mission has been outlined, and the importance of supplemental helicopter evacuation support by nonmedical aviation agencies has been described. The superiority of the company type organization for medical helicopter evacuation elements is pointed out and a rec-

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ommended balanced unit is proposed. The desirability of providing the Army Medical Service with both reconnaissance and utility-type aircraft leads to the recommendation that such aircraft be provided on a 3:1 ratio. Currently available evacuation helicopters can be improved by modification of certain ones with flotation gear and additional navigational aids. There is a requirement for broadening the career pattern for Medical Service Corps pilots to ensure normal logical progression in aviation and other normal functions of the Army Medical Service. Critical evaluation of these experiences and lessons learned in Korea will prove particularly beneficial to the Army Medical Service as it develops its helicopter evacuation program for the future.

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HOW TO REVIEW A BOOK

A good book review should answer three questions. First, is the book worth while? Second, can one depend upon it from the standpoint of accuracy, completeness, and logical conclusions? Third, is it worth the money asked for it? . . .

In trying to indicate what a good review should be, it may not be amiss to include a word as to the pitfalls to avoid. A mere recital of table of contents with a few complimentary words about the illustrations, typography, and so forth, sometimes passes as a book review but probably deceives no one. On the other hand, a search for errors in spelling, construction, and debatable conclusions may result in devastating and perhaps deserved criticism, but neither does this constitute a book review. . . .

To put it as concisely as I can, I would say that a good review should define the scope and plan of the work in question, set forth its major premises, and point out if possible its importance and significance to the medical world. If one can add something of praise as to originality, careful presentation, good writing, and so forth, I think the reviewer has an obligation to do so, for heaven knows everyone in this world needs a lift along the way and no one knows how much good a kindly word can do.

—SUMNER L. KOCH, M. D.
in *Bulletin of Medical Library Association*,
pp. 148, 149, 150, Apr. 1953

THE SEMIMOBILE EVACUATION HOSPITAL

HAROLD W. GLASCOCK, Jr., *Colonel, MC, USA*

SEMIMOBILE evacuation hospitals constitute an essential link in the system by which the Army Medical Service cares for sick and wounded persons under battle conditions. The definitive medical and surgical treatment which they render to patients with all types of injuries or illnesses has done much to reduce morbidity and mortality rates in zones of combat. While the number and scheme of employment of these units have shown considerable variation among the several theaters of war during the past decade, there has been no major modification with respect to the evacuation system. Though air evacuation may alter their future tactical mission and geographic location, the necessity for such hospitals with the characteristics of moderate bed capacity, flexibility, mobility, and competence to render all-embracing, definitive professional service will continue to exist.

The importance of these units and the likelihood that similar hospitals will be required in case of large scale civilian disasters led me to present information gained and opinions formed during my service as commanding officer of a 400-bed, semimobile evacuation hospital. This experience covered mobilization, overseas deployment, and field service aspects of the unit's operations. Yet no pretense is made that the means, methods, and ideas described herein are the only measures by which such a unit may accomplish its mission effectively.

PERSONNEL

A military hospital with the mission of providing immediate and definitive patient care under field combat conditions must be a completely integrated and efficiently functioning unit. In this respect it may be compared to an athletic team. The commanding officer and his administrative staff are the coaches and business managers; the professional personnel are the players. It is well known that while a game is in progress the players must perform harmoniously and with the least amount of outside assistance or interference. This dictum is equally valid for the staff of an evacuation hospital. Skilled professional specialists must be free to render appropriate surgical or medical diagnoses and treatment, and to effectively use the available supplies,

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equipment, and ancillary personnel. Because they must work at top speed and with maximum efficiency under physically strenuous and mentally taxing conditions, every effort must be made to shield them from disturbing influences. As with the athletic team, the success of these efforts requires constant emphasis, prolonged training, unit loyalty, and high morale.

Although this principle applies to all military organizations, it is believed to be more important in an evacuation hospital which is faced with special problems in the performance of its highly technical mission. In addition to giving medical care, the staff of the hospital must be able and prepared to erect their own physical facilities, either under canvas or by the rehabilitation of war-torn buildings.[1] They must also be prepared to move the entire hospital on short notice, with the least possible delay, and to guard and defend the unit en route or on location. The means of accomplishing these objectives must be provided for so that the unit may function with a minimum of outside direction and assistance from other branches of the Army.

The complexity of the organization arises from the following factors. First, the Table of Organization and Equipment (T/O&E) provides a ratio of personnel to bed capacity of 0.8 person per bed, as compared with 0.6 per bed in a relatively fixed numbered general hospital, and 1.4 per bed in zone of interior hospitals. Hence, fewer personnel are available to perform a more complex mission. Second, the situation is further complicated by the fact that there are 41 different types of technical specialists among the enlisted personnel and 26 among the officers. Many specialties may be the responsibility of a single person. Under these circumstances, complete 24-hour coverage is a practical impossibility; yet this type of service is often required for protracted periods. Thus, it is imperative that a constant and intensive understudy program be maintained. Each person assigned to an evacuation hospital should be capable of performing the job of at least one and preferably two other specialists. Furthermore, his morale must be such as to make him eager to work in another technical field whenever the need arises; otherwise, the organization will break down under stress. Third, constant changes in personnel due to sickness, injury, expiration of term of service, rotation, compassionate leaves, and orders from higher authority, coupled with the fact that qualified replacements are frequently not available or are delayed in reporting, emphasize the need for training personnel to perform the 67 different types of technical jobs. In an evacuation hospital it is reasonable to expect a turnover of personnel of from 30 to 40 percent within a period of six to eight months after arrival in a combat zone.

Teamwork is important because of the uneven flow of admissions and dispositions. A sudden influx of large numbers of patients requiring emergency care must be handled efficiently and with confidence. Likewise a sizable number of patients to be evacuated must be processed expeditiously. Frequently, these operations must be carried out concurrently. In either case the importance of professional and administrative records cannot be overlooked. Both functions must be conducted without confusion or disorder. Split second timing and complete understanding, together with wholehearted co-operation and co-ordination, are primary requisites for these operations.

In order to be a fully productive member of the evacuation hospital team, each professional or technical specialist must be a well-trained field soldier. He must also possess a thorough knowledge of several jobs other than his own and complete information concerning the general operation of the organization on a day-to-day basis. These requisites apply to male and female officers as well as to all enlisted personnel. There is no other type of organization in the Army medical service in which they are more important.

The development of teamwork requires time, education, training, and constant practice if the organization is to avoid a long "shakedown" period after it gets into actual operation. Teamwork cannot be attained unless all personnel and equipment of the unit are concentrated in one place, and the opportunity is provided for all members to work together at the job they are to perform, at least on a simulated operational basis. Newly assigned professional personnel must be afforded the means of establishing uniform policies consistent with those of the Army medical service. Officers must learn to know the weaknesses and peculiarities of their associates. Personalities must be given time in which to make adjustments. Each person must be taught to take care of himself under field conditions. He must also learn to perform highly technical procedures with improvised means and methods. Maintenance and conservation of supplies and equipment must be stressed. These important considerations cannot be imparted to personnel in a few days. Several months may be required. A definite training program with specific objectives must be followed through to completion and testing, in order to establish confidence and operational efficiency.

IMPORTANCE OF TRAINING PROGRAM

In my opinion the mobilization and training program (ATP 8-305) prescribed for evacuation hospitals by Army Field Force directives is sound and will produce the desired results. Experience with such a unit has produced convincing evidence that deviations

from this program result in serious handicaps, costly errors and delays, and low morale. All of these are major causes for concern to the unit commander. This is illustrated by the following account of the problems encountered by one such unit.

The major portion of the enlisted personnel of an evacuation hospital were assembled at an Army post about 15 months prior to their deployment to the Far East Command in December 1950. During this period they were employed as an augmentation unit for the post hospital in which they became key personnel but they were unable to work together as a unit. Under these circumstances they could not be released for unit training until four weeks prior to departure overseas. Hence, this training time, all too brief, had to be used to complete the individual requirements for overseas movement. No time was available for instruction or experience in such basic matters as the pitching of hospital tents and the operation of a mess under field conditions. Seven administrative officers also had been present for duty with the evacuation hospital but they were also placed on temporary duty with other organizations at the post. Several of the original group were replaced a few weeks prior to the departure date. In spite of their capabilities they were unable to conduct a satisfactory training program under these conditions. A few Army Nurse Corps officers who were on duty at the post hospital had paper assignments to the evacuation hospital, but no other associations with it. Other than the evacuation hospital commander, who reported for duty four months prior to departure time, no permanently assigned medical officers were present for duty until 60 days prior to movement to the port. Even then they were immediately placed on duty in the post hospital. These factors again eliminated any opportunity to conduct anything resembling a unit training program. The administrative staff officers, after much hard work and without benefit of professional advice, were able to devise a standard operating proceedure and to orient a few key noncommissioned officers concerning its provisions. All officers were required to study it; however, no opportunity was afforded for testing these plans and procedures under simulated operating conditions.

Thus, an aggregate of personnel was assembled and hastily moved to a port of embarkation with the Korean combat zone as its destination. Due to crowded conditions on the transport only one hour per day could be devoted to training. Fortunately, the ship was diverted to Yokohama, but unfortunately the professional officers and key enlisted specialists were again placed on duty in Army hospitals throughout Japan. The administrative officers and about one half of the enlisted personnel were stationed with a newly arrived numbered general hospital from which

the latter group was finally able to borrow a minimum amount of training equipment in order to practice tent-pitching and the technics of establishing various parts of the hospital under canvas, one section at a time. In addition, about 100 enlisted men were newly assigned to the unit a few days before it departed for the combat zone. Therefore, up until the time of actually going into operation, none of the professional officers and less than half of the enlisted men, all of whom came from widely varied backgrounds, ever had a chance to work together as a team.

On arrival in Korea the staff of the hospital was allowed one week in which to draw its equipment and receive a brief orientation. At the end of this period they moved 227 miles and established a 400-bed hospital within four days. The lack of previous mutual experience resulted in a prolonged "shakedown" period. Fortunately, the tactical situation permitted the unit to remain in one location for several months where it functioned more as a station hospital than as a true mobile evacuation hospital. The question of whether or not it could have functioned as effectively as it should have under active tactical circumstances is, in my mind, still very much in doubt. Had the mobilization and training program for evacuation hospitals been followed as prescribed by Army Field Forces, the unit would undoubtedly have been in a more favorable position to carry out the mission for which it was designed.

After 18 months in the combat zone, the rotation system brought about a complete turnover in personnel. During this period the unit made only one move to a new location. An average patient load of 75 percent of capacity prevented practice moves. Didactic and on-the-job training was the only means of preparing new personnel for their jobs. Though short overlapping periods were provided for replacements and rotatees, this time was not adequate for their complete orientation to hospital operations under all conditions.

SUPPLIES AND EQUIPMENT

As a general principle, an evacuation hospital should be logistically self-sufficient in direct proportion to the distance its personnel must travel in order to obtain various classes of materiel, and to the difficulties which may be encountered in making the round trip to supply points. The current system of echeloned logistic support works satisfactorily under normal circumstances, but in my experience circumstances under field conditions are normal somewhat less than one half of the time. While the economy of supply demands that stocks on hand be kept to a minimum consistent with existing conditions, the application of hard and fast directives with respect to the maintenance of stock levels

and periods of requisitioning sometimes works hardships on using units. When the unit is located in the vicinity of the various classes of depots, satisfactory service is easily obtained. Long distances, poor rail and road conditions, and bad weather can present serious obstacles. For several months our drivers had to make daily round trips of 75 miles or more, over extremely poor roads and under all types of weather conditions, in order to support the unit logistically.

The principle of self sufficiency must be balanced against the necessity for mobility. The unit must maintain itself in readiness to move its entire personnel and equipment with its organic transportation by using the convoy shuttle method. Thus, the total load to be moved must be in keeping with the amount and type of transportation available as well as the estimated time required for movement. These variables must be judged by the hospital commander and his staff. When the hospital is operating a considerable distance from the fighting area or when the tactical situation is comparatively static, it is possible to stock up greater tonnages. Conversely, proximity to the enemy or to fast-moving battles requires that tonnages be kept to a minimum.

The equipment and supplies provided by T/O&E 8-581 with changes thereto, and Medical Equipment List No. 8 dated August 1951 represent the absolute minimum required for the operation of a hospital. While this is in keeping with the desired mobility, there are several deficiencies which must be corrected by the hospital commander. In the first place, he must find a means of housing his personnel. The T/O&E provides only enough tentage for the hospital proper and its patients.* No cots or tentage are available for unit personnel. It is unrealistic to expect officers and enlisted men to be quartered in shelter halves and to sleep on the ground. Action must be taken at the earliest possible time following arrival in the combat zone to obtain adequate hospital tentage and quartermaster cots to satisfy this requirement. In some cases, elaborate justifications are required to convince line staff officers of this necessity because these items are rarely in plentiful supply.

Second, the supply of construction and maintenance tools, especially those of the power-driven type, is inadequate. Skill saws, pipe threaders, and welding equipment are not provided. The supply of electrical equipment is woefully short of minimum needs and the generator capacity will not take care of a fully operating 400-bed hospital. Theoretically, these needs can be supplied by nearby engineer units, but experience has proved

*SR 310-30-40 prohibits the authorization of tentage for personnel in the T/O&E. Suitable tentage may be available as class IV supplies under the control of the theater commander.

that they are not always in the vicinity, that their equipment is not always in operating order, and that they are called upon to perform other high priority jobs. Hence, such equipment may not be available at the time that the hospital is in dire need of it. It pays dividends to find personnel in the hospital unit who can use these items or to take action to obtain them prior to arrival in the combat zone. Such men will be extremely useful in rehabilitating war-torn buildings, constructing tables and chairs, repairing items of equipment, and improvising means and instruments which facilitate operations. It is practically impossible to provide for every contingency, but the availability of these items and personnel capable of using them will increase the flexibility and efficiency of the unit. They will also contribute to the welfare and comfort of patients and personnel.[2]

OPERATIONS

The hospital organization is designed to provide definitive diagnosis and treatment to all types of patients, with the possible exception of those with neurosurgical disorders. Under certain circumstances the staff may be augmented by specialized professional teams in order to increase its ability to handle the volume of patients and the variety of their conditions. In cases where air evacuation is readily available the necessity for such assistance is minimized.

The nature of the evacuation system makes time and space factors of cardinal importance in the satisfactory management of disease and injury. In order to reduce these factors as much as possible in a forward-moving tactical situation, the hospital should be within 15 to 25 miles of the area in which its Army Corps is fighting. In a retirement, however, it should be slightly further to the rear, about 25 to 35 miles. Should movement in either direction be rapid, the hospital commander will do well to split the unit in two nearly equal parts, so that one part may leapfrog the other in the appropriate direction while a 200-bed hospital is maintained in constant operation. In this connection, the commander must have made reconnaissances in either direction to select sites for future locations, and should have suitable locations reserved by proper authority.

In choosing suitable locations, the commander and his staff must consider a variety of important factors. First, the matter of space requirements for each section of the hospital must be determined, as well as the total space needed to accommodate the entire unit. The peculiarities of tentage and buildings should be given consideration in arriving at these estimates.

Second, because only rarely can the entire unit be housed in buildings, and because the hospital must be moved and estab-

lished at new locations by sections, it is well to provide a definite priority list. A suggested priority list for the movement of sections, including estimates of building floor space requirement for each, is given in table 1.

TABLE 1. *Breakdown of space requirements for an evacuation hospital*

Group	Section	Space required in square feet	Total space required
1	Operating Shock Triage X-ray Centralized materiel	4,860 972 972 972 528	8,304
2	Receiving and evacuation Registrar Property exchange and patients' property	972 486 972	2,430
3	Pharmacy and laboratory	972	972
4	Consolidated messes	2,472	2,472
5	Twenty-three 20-bed wards	972 (per ward)	22,356
6	Hospital headquarters Detachment headquarters	1,458 528	1,986
7	Army Nurse Corps quarters	3,696	3,696
8	Male officers' quarters Enlisted quarters	2,640 11,664	14,304
9	Supply and laundry	3,444	3,444
10	Motor pool	972	972
Total			60,936

When considering the use of buildings the physical arrangement must be kept in mind. Buildings should be selected which will permit all components of an individual group to be placed on one floor, with the exception of groups 5, 7, and 8 (table 1), which can be divided. Buildings with workable elevators will rarely be available; hence professional services should be kept as close to the ground floor as possible. For security reasons it is well to place the quarters for women officers on the second floor above the ground. Adequate fire prevention and fire-fighting measures must be carefully provided. First choice should go to buildings having large rooms and wide hallways in order to reduce personnel requirements. It is well to locate groups of facilities according to an assembly line system, in order to prevent traffic jams when all activities must be carried out with maximum efficiency at the same time.

Evacuation policies are usually established by the Army surgeon and are applied by the hospital commander and his staff in keeping with the local situation. It is a basic principle that the hospital must have beds available for the anticipated number of patients to be admitted within a 24-hour period. It was a standard practice in Korea to maintain at least 100 vacant beds for the next day's admissions. At the time the registrar made his nightly telephone call to the medical regulating officer at Eighth Army Headquarters he reported the number of patients in each category who were ready for evacuation and the number to be returned to duty in the next 24 hours. At the same time he inquired concerning the estimated number of patients that would be flown to the hospital during the same period. If the latter number exceeded the number of beds which would be available for them, the registrar increased the number of patients to be evacuated in order to create vacant space. The chiefs of professional services were then instructed to screen their patients again and to prepare the required additional number for evacuation. This was a continuing process. Medical officers are frequently reluctant to evacuate interesting patients. In addition, they like to keep patients until they can be returned to duty in order to make a good record for their services. As a result, the hospital commander may have to direct that certain patients be evacuated in order to make space available.

In addition to the above factors, it is wise to have a comprehensive standing operating procedure printed for wide distribution among the staff and to require each member to become thoroughly familiar with its provisions. Even though much of the actual operation of a field medical unit is patterned after that of fixed installations having similar professional responsibilities, its

environment necessitates minor variations and improvisations in relation to fundamental operations. Having a ready reference to an official guide prevents numerous errors and misunderstandings.

Finally, it is well to remember that basically the hospital is considered to be self-sufficient except for the attachment of an ambulance platoon. Nothing is delivered to its doors except a few patients requiring emergency treatment from units in the vicinity. The staff must prepare requisitions and justify its needs for everything, including personnel, and then go and get them. Each administrative officer must plan well in advance; he must use all possible foresight; he must be a super-salesman, expert at improvising as well as adept in establishing friendly relations with all agencies which may be of service to the hospital. Most members of allied forces are favorably inclined toward a hospital. However, this initial advantage should be further increased at every opportunity. Such action will produce many beneficial results.

MEDICAL RECORDS

It is impossible to place too much emphasis on the value of complete and accurate medical records. I believe that the use of standard clinical records is not only feasible in evacuation hospitals, but that such should be mandatory. The Field Medical Record and Jacket are totally inadequate except for patients with the simplest diseases and injuries, who in most cases should not be evacuated any further than a clearing station. It was necessary for our staff to mimeograph clinical record forms on poor grade paper which did not take ink well; to fold and keep these papers together in the Field Medical Jacket as well as possible, and to improvise in countless other ways in order to have clinical records of any value. The present situation precludes the development and maintenance of superior professional standards. It is too much to expect Medical Corps and Army Nurse Corps officers to record the details of major operations or severe medical diseases in a clear and readable handwriting on 2.5- by 3-inch paper, no matter how many such sheets may be available. Yet these details are frequently of major concern at succeeding hospitals in the chain of evacuation.

Because the shipment of adequate supplies of blank forms from the zone of interior to the using unit is both expensive and time consuming, such forms could be printed by indigenous sources in the zone of communications at a cost which would be commensurate with their extreme value to the efficient operation of hospitals in the field.

RESEARCH

Until recently it has been considered impossible to conduct professional research in the combat zone. Time was not believed to be available. Skilled and interested personnel were in short supply. The use of highly complicated equipment and instruments was not considered to be practical. Lastly, ancillary personnel could not be afforded for such missions. Experience in Korea has proved that none of these factors are now valid reasons for failure to give appropriate study to the major medical and surgical problems which develop in the combat zone.

Time is available, provided the interest of qualified personnel can be sufficiently stimulated toward the solution of a given problem. True, there will be a peak workload, but there will also be periods in which it will be difficult to keep professional personnel fully occupied. Research projects of almost any type will provide gainful occupation at such a time, thereby contributing much to the professional esprit and morale of the unit.

A major portion of our young Medical Corps officers and some of our nurses have had contact with research operations during their graduate and undergraduate training. Expert professional consultants who visit the combat zone are available for consultation and guidance. The speed of mail communications makes it possible to obtain technical advice and assistance from the zone of interior with relative ease. Hence, there is no reason to slight research problems.

In recent times such complicated instruments as flame photometers and artificial kidneys have been successfully used in the combat zone. Supplies of uncommon chemicals and special instruments have been maintained in the combat zone hospitals by means of air transportation. Other special pieces of equipment have been improvised on the spot. So long as the spirit is willing there seems to be a way of obtaining the desired material.

The provision of skilled technicians poses a problem at first glance. This can also be solved provided time is taken by the chief of the project to train our nurses and enlisted men. The author has found that such personnel not only are willing, but are interested and capable of learning the most skilled and technical procedures. Research also contributes to their satisfaction and morale.

The only real obstacle to professional research is the matter of recording it and securing publication. Few of our medical officers have had this experience. Typewriters and skilled medical stenographers are in short supply. The latter cannot be ade-

quately trained under field conditions. The channel through which reports and papers must be processed before arriving in the hands of the editor of a professional journal is so lengthy that it discourages the author at the outset. However, professional meetings and theater medical bulletins do much to overcome this last hurdle.

Much information and data concerning disease and injury in the combat zone should be accumulated and studied, and evacuation hospitals furnish an ideal setting. Great benefits can be derived from such research activities. Hence it is a function of the hospital commander to stimulate and maintain a progressive research program.

SECURITY

For the purpose of this article the term "security" is defined as adequate protection and safety for personnel and government property, as opposed to the general use of the term to mean the care of classified military information. Security of the entire hospital while in operation or in movement is a responsibility of the unit commander. The tables of organization and equipment provide the minimal means for its execution. The unit must improvise the plans and equipment for providing adequate locked storage space, fire prevention measures, interior guard, and external walls or fences.

On occasion the unit commander may have to purchase additional locks. Heavy chicken wire, if used in triple layers and interlaced with barbed wire, serves to form a barrier within food and clothing storage tents. It is desirable to have section personnel quartered in these storage tents and to make sure that a responsible soldier is on duty in these tents at all times. Even under these circumstances food and equipment may disappear. Frequent inventories and property checks are required, together with the assistance of a well-developed criminal investigation system. Only by such means can the commanding officer be reasonably sure of having supplies and equipment for operational use and protect himself from having to pay for sizeable property losses.

A few fire extinguishers are included in the unit assemblage. These are woefully inadequate, especially during the winter months. The unit commander will do well to improvise water or sand barrels and buckets, and to distribute them liberally throughout his area. Fire drills must be held. Extra fire guards must be posted and daily fire inspections must be religiously carried out. There is nothing more disconcerting to a commanding officer than to be awakened by a fire alarm and to see a ward tent disappear in smoke.

Occasionally the hospital may have an extra platoon of a separate collecting company attached to it. This unit may be used to provide an interior guard. Such an arrangement is fine if the men are well trained and their officers are capable leaders. But a poor guard can do much more harm than good. It is better perhaps to form the interior guard from regularly assigned personnel.

Fences or walls become an important security factor while the unit is in operation. Again, these are not provided for in the unit assemblage. Wire of all types is at a premium in the combat zone. Hence, a detailed justification for new wire is required. In case it cannot be obtained, then it becomes necessary to recover wire that has been used for other purposes. This can be a dangerous procedure in areas where mines and booby traps have been laid by the enemy or our own forces. It is an extremely good rule to leave all wire alone unless one knows by whom and for what purpose it was last used. Once the wire has been obtained it is well for the unit commander or one of his staff to know how to make the maximum use of it. This can be accomplished by constructing single or double aprons in addition to multiple strands on poles. Concertina wire can be very helpful in fast moving situations. But walls and fences are not to be relied on alone. Guards must be instructed to keep unauthorized persons away from the fence. Patients can easily tear it down or pass property through it. Prowlers can quickly cut it if allowed to get close enough. In a fairly stabilized situation in which friendly forces have air superiority it is well to improvise floodlights and to employ them along the fence line. Fences should be more substantial around areas where nurses live and work, particularly when they are the only caucasian women in the combat zone.

Security from guerilla attack is generally provided by surrounding units, but the hospital personnel must be trained and organized for defense. On one occasion my unit was left in an isolated area with only one Military Police platoon within a 25-mile radius. In such instances, it is well to have a few automatic weapons and to let the indigenous population know that hospital personnel can use them effectively. In the above case the Military Police lieutenant was kind enough to park his armored car in our compound overnight. A show of strength may be extremely valuable, though it is hard to imagine an actual attack, with professional officers and nurses coming under fire, and the consequent confusion. It may be worth while to consider the possibility of using ambulatory patients as reinforcements in case of a real attack.

Finally, the proximity of friendly installations which may invite enemy attack must be considered by the unit commander. The unit may move into a relatively safe area, only to have a gasoline

or ammunition depot placed adjacent to the hospital. While in my experience there is very little that can be done about this, it is well to lodge a strong protest with proper authority in order to point out the hazards and to relieve the hospital commander of some of the responsibility which might otherwise fall upon him in case of disaster.

SUMMARY

An evacuation hospital is a complex organization which requires the co-ordinated efforts of a well-developed team in order to operate efficiently. I have pointed out many factors which deserve the consideration of an evacuation hospital commander in the hope that some benefit may be derived by those officers who may carry such responsibilities in the future.

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LUMBAR PUNCTURE IN MENINGITIS

It has long been my contention that intrathecal treatment is not necessary and therefore should be regarded as contraindicated for any kind of meningitis. No permanent benefit is derived by frequent withdrawal of spinal fluid for the purpose of relieving intracranial pressure, nor ought there be a demand for lumbar punctures daily or every other day in order to have the laboratory make a report on the patient's progress.

The primary purpose for a lumbar puncture should be for diagnosis. More than one puncture is seldom required for purulent meningitis. In tuberculous meningitis there may be difficulty in detecting the organism and more than one puncture is often justified. If a meningitis patient has petechiae in the skin and a smear from one of the lesions discloses the gram-negative organism, no spinal taps are needed. The same holds true if a positive blood culture has been obtained for the offending organism.

After an etiologic diagnosis of meningitis has been determined it is merely necessary now to select one of a number of drugs which have been proved to be effective against the organism concerned. If response to the remedy does not seem to be satisfactory, then sensitivity tests with other drugs should be made.

—ARCHIBALD L. HOYNE, M. D.
in *Annals of Internal Medicine*,
p. 1166, Dec. 1954

Clinicopathologic Conference

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EPIGASTRIC PAIN

Summary of Clinical History. A 31-year-old Army sergeant was admitted to this hospital because of pain in the epigastric region of 36 hours' duration.

The illness began during the previous night with progressively severe midepigastric pain radiating to the periumbilical region, to the right upper quadrant of the abdomen, and to the back. He had associated nausea and gagging, but no true vomiting. One year previously he had had upper gastrointestinal distress which had been relieved by phenobarbital. This had developed while he was stationed in Korea, and he was returned to the United States because of this complaint with associated increased nervousness. Following his return from Korea he began drinking heavily, consuming one pint or more of liquor per day. There was no history of previous operations or injuries. A man with 11 years of military service, he was a heavy drinker and a moderate smoker, but denied any drug addiction.

Physical Examination. The patient was a well-developed, well-nourished white man; his face was flushed and he was apparently in acute pain. His temperature was 100° F. orally; pulse, 96; and blood pressure, 146/96 mm. Hg. The head and neck were described as normal. The eyes were of normal appearance. The pharynx showed minimal injection. The lungs were clear. The heart was described as normal. Examination of the abdomen revealed acute muscle spasm in the upper portion, especially in the right upper quadrant. There was tenderness to palpation in the epigastrium with rebound tenderness in the right upper quadrant. The liver was palpable two fingerbreadths down from the costal margin. The extremities and the external genitalia were normal. Rectal examination was negative except for slight tenderness.

*Col. James L. Tobin, USAF (MC), Commander and Chief of the Medical Service. From the Laboratory Service, Capt. Mark S. Reed, USAF (MC), Chief.

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Laboratory Findings. On 18 February 1953, the erythrocyte count was 5,810,000 per cu. mm.; hemoglobin, 15.5 grams per 100 ml.; leukocyte count, 18,000 per cu. mm., with 90 percent neutrophils, 8 percent lymphocytes, and 2 percent monocytes. The urine was acid, amber in color, in quantity insufficient for specific gravity determination; albumin, one plus; sugar, one plus; acetone, two plus; there were four to six white blood cells and one to two red blood cells per high power field, and two to four hyaline casts per low power field with an occasional coarse granular cast.

On 19 February the hemoglobin was 14 grams per 100 ml.; leukocyte count, 19,000 per cu. mm., with 92 percent neutrophils and eight percent lymphocytes. Blood urea nitrogen was 10 mg. per 100 ml.; sugar, 182 mg. per 100 ml.; CO_2 combining power, 64.5 volumes percent; serum amylase, 85 units (normal laboratory values, 15 to 20 units). Cephalin-cholesterol flocculation (24 hours) was two plus, (48 hours) three plus; thymol turbidity, one unit; serum bilirubin was not elevated. Total protein was 7.62 (albumin 4.84, globulin 2.78) grams per 100 ml.

On 20 February a spinal tap revealed normal pressure; fluid was bloody at first but clear later; there were two lymphocytes per cu. mm.; sugar was 87 mg. per 100 ml.; bacterial culture was negative after 96 hours.

Roentgenograms of the chest on 18 and 19 February did not show definite pneumonia but there were prominent markings in the right lower lung field. A roentgenogram of the abdomen on 18 February showed no free air under the diaphragm. The delineation of soft tissue was good; the liver was enlarged, and there was no evidence of intestinal obstruction. On 19 February a roentgenogram of the abdomen showed more gas in the small bowel and a moderate amount in the colon. No other abnormality was demonstrated; however, the delineation of soft tissue was not as good on the left side of the abdomen as on the previous study.

Course in Hospital. At 1930 hours on 18 February the patient was taken to the ward and a Levin tube was passed. During the intubation, the patient had a grand mal type seizure with tongue biting, ending in muscle flaccidity. Examination of the abdomen at this time showed minimal increase in muscle tone with good peristaltic sound. The liver was palpable three fingerbreadths below the costal margin. There was minimal response to deep palpation. Rectal examination showed some tenderness high; otherwise, findings were not abnormal. The patient received 100 mg. of meperidine hydrochloride (demerol) and an intravenous infusion of 1,000 cc. of a five percent solution of dextrose in distilled water. The following morning the patient continued to complain of upper abdominal pain radiating to the back, with

associated coughing and anorexia. The temperature dropped from 101° to 99° F., the pulse increased to 120, and the blood pressure to 155/110 mm. Hg. Physical examination at this time showed three plus inflammation of the throat, depressed breath sounds, and dullness in the bases of the lungs. The heart rate was rapid with no murmurs and no irregularities. The abdomen showed spasm with muscle guarding and tenderness in the upper abdomen. There was marked right upper quadrant tenderness on compression of the right chest. Peristalsis was decreased. Medication at this time included meperidine hydrochloride, 2,000 cc. of a five percent solution of dextrose in distilled water, one ounce of aluminum hydroxide gel (amphojel) every two hours, 8 cc. of donnatal three times a day, 180 mg. (300,000 units) of penicillin and 0.5 gram of streptomycin every six hours.

In the afternoon of 19 February, the patient was examined at the neuropsychiatric service. It was believed that this was a case of alcoholism with convulsions due to withdrawal. A concomitant abdominal process requiring surgery could not be ruled out, but the clinical picture was more suggestive of acute gastroenteritis. The consultants favored treating with a "Bellevue Cocktail." He was then given an intravenous infusion of 1,000 cc. of a 10 percent solution of dextrose in distilled water with 30 units of regular insulin and 1 cc. of thiamine. At 2000 hours the same day, because the flat film of the abdomen showed a dilated large bowel, a Miller-Abbott tube was passed. Peristalsis was again active. The patient felt subjectively improved and the abdomen was described as no worse. That evening, he became restless and confused. He saw imaginary people and talked with them. Because he was very disoriented the next day, he was transferred to the neuropsychiatric service. Diagnosis of delirium tremens was made, and he was given three doses of 1.2 grams of chloral hydrate by mouth over a nine-hour period. He was still difficult to manage, and it was necessary to place him in restraints.

That afternoon, the patient was still restless but appeared to be improved. He talked coherently, but had definite tremors of the hands and lips. His temperature rose to 101.4° F. Physical examination of the abdomen showed it to be firm and slightly distended, with moderate guarding in the upper abdomen. No deep tenderness or rebound tenderness was noted. The bowel sounds were described as normal. Because of the tremors and restlessness barbiturates were used, although with reluctance because of apparent liver damage. At 1600 hours on 20 February, the patient's pulse was 168. He developed episodes of Cheyne-Stokes respiration and became opisthotonic. It was believed that he was now more of a medical than a neuropsychiatric problem, and he was transferred to the medical ward.

On arrival, physical examination was very difficult because the patient was wildly delirious. There was definite scleral icterus. The lungs were clear anteriorly. The heart was borderline in size with a regular tachycardia. A systolic murmur was heard at the apex and left sternal border. There was no friction rub. When a spinal tap was performed, the pressure was normal. The first fluid was bloody but later cleared. At 1900 hours the patient was described as being in extremis. His temperature was 106° F. and the heart rate 170 with distant tones. Breath sounds were decreased in the left anterior chest. No rales were heard. At 2030 hours, he had a prolonged grand mal seizure, vomiting a small amount of dark brown material. He subsequently became very cyanotic and breathing ceased. Artificial respiration was attempted but was unsuccessful, and he was pronounced dead at 2045 hours.

DISCUSSION

Doctor Reed: Before proceeding with the discussion, I would like Doctor Claypool* to kindly show the films.

Doctor Claypool: The first series of films is a set of chest roentgenograms. The first one was made in January 1952 and the others on 18 and 19 February 1953, at the time of his admission. None of them show anything particularly startling, but it is noted that the right side of the diaphragm seems a bit higher on the film taken in February 1953 than on the one made a year previously; however, I do not believe that any great significance can be attached to this. There is no evidence of any pneumonitis immediately above the diaphragm to indicate subdiaphragmatic disease, and no free air can be seen beneath the diaphragm on these films. The next series of films are the flat plates of the abdomen. None of these were made in the upright position. You can see that there were no fluid levels in the stomach, and no air bubble on any of the films. The first two were made on the date of admission, the second two on the following day. You can see by looking at the set of films that there was increasing gas in the bowel. The area of gas extends to the region of the splenic flexure. We see again no evidence of the outside boundary of the bowel, indicating again that we have no definite evidence of free air in the peritoneal cavity. The exact significance of distension of the colon over to the splenic flexure is a matter of conjecture in this case. In an adynamic ileus that is progressing, there will be a progress of the gas up to a point, and if films are made later on, one will see the air progressing beyond that point. However, again in a mechanical ileus, such as would be found in an obstruction, you will have findings of gas up to a point again. Therefore, we have no diagnostic features on this film. These findings would be compatible with an adynamic ileus due to any of the causes of peritoneal irritation or pain in the abdomen. They could

*Maj. Harry R. Claypool, USAF (MC), Chief, Radiology Service.

also indicate a mechanical obstruction, such as volvulus on the left side of the colon or an intussusception through the transverse colon to the splenic flexure. I see no evidence of gallstones or of pancreatic calculi. Do you have any questions on the films?

Doctor Hoffman:* I would like to ask one or two questions, Doctor Claypool. As far as you can tell, the psoas shadows are fairly well outlined. From that, would you say that fluid in the peritoneal cavity would be minimal?

Doctor Claypool: That's right. The presence of the psoas shadows, and also the fact that there are well-defined properitoneal fat lines which are usually obliterated if there is any great amount of fluid present, would rule out ascites.

Doctor Hoffman: Do you think there is more than one point of obstruction there? Do you think that this obstruction is distal to the splenic flexure?

Doctor Claypool: No, my point is simply that the gas goes up to the splenic flexure of the colon. Beyond that we cannot be sure.

Doctor Hoffman: And just one other question about the diaphragm; can you give me any more information about that? As far as you are concerned, the position is not abnormal?

Doctor Claypool: It is within the limits of normal. There is no haziness of the diaphragm such as would occur if there was an abscess or infectious disease.

Doctor Hoffman: How positive are these films in this particular position in detecting air or gas under the diaphragm?

Doctor Claypool: These particular films are made in the flat position, so they are of no value whatsoever. The chest films will show an appreciable amount of gas under the diaphragm; however, a small amount might not be detected immediately beneath the diaphragm on chest technic.

Doctor Hoffman: Do you think that the technic is adequate here to rule out gas under the diaphragm?

Doctor Claypool: I would certainly favor the fact that we have enough evidence here to assume there is no free air in the peritoneal cavity.

Doctor Hoffman: Was there anything about the renal shadows?

Doctor Claypool: Nothing that would be of diagnostic help here. We mentioned previously in our discussion that there was some lobulation of the right renal shadows, but I believe that that was just fetal lobulation.

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*Lt. Col. Franklin G. Hoffman, USAF (MC), Chief, Respiratory Disease Section, Medical Service.

Doctor Hoffman: Thank you, Doctor Claypool. In proceeding to discuss this case, I think that we must confine our discussion to those conditions which might produce this catastrophic series of events. I would like to dismiss, merely in passing, some of the few common causes of abdominal pain which arise from lesions above the diaphragm, namely, myocardial infarct and acute pericarditis. I am sure that many of us are not aware all of the time that acute pericarditis can simulate an acute abdomen, very frequently with abdominal pain, spasm, and shock. Lower lobe pneumonia and dissecting aortic aneurysm must be mentioned. However, I believe there is no evidence in the history or subsequent findings to substantiate any of these possibilities. Likewise, we may, on the basis of the available information, rule out malignant lesions, especially lymphoma, in which invasion of a vital organ may result in rupture, perforation, or obstruction. I do not believe we need to consider seriously a granulomatous involvement of the abdominal organs. Amebic abscess and primary liver disease, hepatoma with rupture, and hemoperitoneum do not warrant serious consideration.

The initial elevation of the diaphragm worried me a little bit, but I do not think that that is significant, at least from what Doctor Claypool has said. We might consider some other entities. One I would like to talk about is acute porphyria. We all know it is an uncommon entity and frequently is manifested by the triad of abdominal pain, which is usually colicky and in the lower abdomen, neurologic manifestations, and a port-wine urine. Death in these cases is usually due to an ascending paralysis with respiratory failure. I do not believe we are seriously concerned with this disease in this particular instance, nor do I think we must consider any other metabolic diseases with abdominal manifestations. I thought seriously about volvulus of the sigmoid in view of the x-ray findings. However, with volvulus of the sigmoid, frequently we have a history of constipation of long duration. Usually there are mild attacks of abdominal pain, until the acute obstruction occurs. The majority of patients with volvulus usually are in the age group between 40 and 70 years, and the pain of an acute attack usually is continuous with colicky exacerbations; characteristic also is the extreme abdominal distension which one can usually determine if the abdominal wall is relaxed. Under those conditions also, it may be possible to outline the sigmoid loop. The characteristic x-ray findings, to my knowledge, are a tremendous dilatation of the sigmoid loop with fluid levels, and often two points of obstruction at the sites where the bowel may be twisted.

Mesenteric vascular occlusion is usually a dramatic event and frequently presents a baffling problem. It is more common after the fifth decade, and its sequelae are severe peritoneal irritation and small bowel obstruction. The problem is usually not accurately solved before laparotomy or necropsy. Sometimes it follows abdominal pelvic operations. The arterial circulation is occluded in about 60 percent of the patients, and in 90 percent of these some branch of the superior mesen-

teric vessel is usually involved. Embolism, endarteritis, or a dislodged atheromatous plaque may usually account for the occlusion. Venous mesenteric occlusion usually follows thrombosis or phlebitis. Pain is usually constant or paroxysmal, and is generalized with vomiting eventually becoming fecal. Bloody diarrhea frequently occurs, particularly when necrosis develops. I do not think we need seriously consider this at this time.

I would like to pass on, however, to several other conditions which are less esoteric, but I think are common enough that we have to give serious consideration to them. First is acute appendicitis with perforation; I guess we have all been taught that this should always be considered in the differential diagnosis of any acute abdomen. I believe that in this particular instance the history with the clinical findings are a little bit atypical for a ruptured appendix; however, there is no such thing as a typical picture. Be that as it may, I prefer at this time that we consider other things. One entity is acute cholecystitis with perforation and bile peritonitis. I think there are three features which most of us keep in mind when making this diagnosis. One is the typical pain that is constant and severe in the epigastric region, with reference to the right posterior chest. The pain is severe early and later it becomes constant and dull. The second feature is a tenderness and spasm beneath the right costal margin, and, thirdly, a palpable mass in the right upper quadrant. I think that without this triad the diagnosis clinically cannot be made with certainty.

We now come down to the two controversial possibilities, as far as I am concerned, in this patient. One is acute hemorrhagic pancreatitis. I am sure that was considered quite strongly by the doctors who saw this patient during his hospitalization, and I am certain that we are all familiar with the severe pain, usually epigastric or in the right upper quadrant. It is usually persistent, but it may be paroxysmal or colicky with radiation to the back. Nausea and vomiting are quite common. Temperature elevation is usually slight, unless suppuration or gangrene is associated. Most textbooks state that the abdominal rigidity which one sees with other lesions is not as striking in acute pancreatitis as it is with other acute abdominal conditions. Peristalsis is usually inaudible and jaundice is quite a common feature in acute pancreatitis. Although the history and the appearance of the patient suggested jaundice, the serum bilirubin was reported as not being increased, and I think that is one laboratory finding that we can put a good deal of reliance on in deciding whether or not a patient is icteric. Not infrequently, signs of hypocalcemic tetany have been observed during the course of acute pancreatitis. I do not believe that the episode of the grand mal seizure which was mentioned in the protocol was confused with that of hypocalcemic tetany. Of course, the elevated serum amylase is probably the most constant feature which I think most of us rely on in making a diagnosis of acute pancreatitis. We are all aware that moderate elevation of the serum amylase can occur

in many conditions other than acute pancreatitis. I believe that although the serum amylase, according to the figures that we have available, was slightly elevated in this particular patient, it was in the indeterminate zone. I think that I would like to dismiss the diagnosis of acute pancreatitis, although I still have some hesitancy in doing so.

I would like, however, to discuss perforated peptic ulcer. I am sure we are all familiar with this dramatic abdominal emergency in which a comparatively healthy person is transformed in a matter of minutes to a critically ill patient. The early picture of severe chemical peritonitis due to rapid dissemination of acid gastric contents, with hypotension, tachycardia, and pale ashen facies and a boardlike abdomen, are all too familiar to us. This picture subsides rather rapidly and is probably due to the dilution of the chemicals with transudate. The patient spontaneously comes out of the shock with associated subsidence of his physical findings. Subsequently, if the disease is allowed to continue or progress over 12 hours, peritonitis becomes generalized with vomiting, fever, leukocytosis, ileus, and distension. We are all aware of the fact that perforation is very common in alcoholics and is probably the result of stimulation of the gastric juice with failure to buffer this with the normal intake of food. There is certainly a lot of difficulty in obtaining a previous history of ulcer in alcoholics, and not infrequently we are unable to obtain any previous history when a patient is first seen; however, following recovery, in a large percentage of cases, a typical history of many years' duration is not infrequently obtained.

For the diagnosis of perforation, I would like to see air under the diaphragm, but, because we know that in about 60 percent of the patients air is not seen, and because the technic in this particular examination was not as good as we would have liked to have seen it, I do not know that we can really put too much importance on this negative finding. The terminal event in this patient, I think, is that of aspiration with asphyxia due to respiratory tract obstruction.

The enlarged liver probably demands an explanation. I do not think we have any really good evidence, either clinically or from the laboratory point of view, of severe liver disease. The only finding was that of an elevated cephalin-cholesterol flocculation. I believe that the hepatomegaly perhaps may be explainable on the basis of fatty infiltration, possibly on an alcoholic basis. We could certainly go on and discuss many of the other possibilities, but I think I will say that my impression at this time is that the patient probably had a perforated peptic ulcer with generalized peritonitis. I am not willing to say whether or not he had any localized collection of pus under the diaphragm or in the pelvic cavity. Also, he may very well have had fatty infiltration of the liver due to alcoholic intake, and an aspiration pneumonitis.

Doctor Tobin: How do you explain the stiff neck?

Doctor Hoffman: Well, I do not think it is due to any irritation of the meninges from infection. I think that with severe peritoneal irritation we may rather frequently see spasm of the paraspinal muscles with perhaps a meningismus, but I certainly have no reason to suspect any central nervous system lesions, either bacterial or malignant, to explain it. I cannot explain this man's convulsive episodes. Perhaps the neuropsychiatric service can help on that.

Doctor Reed: Do you think that a patient with perforated peptic ulcer would have sought hospitalization more quickly than 36 hours after onset? And also, would he not have more severe cramping pain with boardlike rigidity?

Doctor Hoffman: I believe that depends on the person's personality make-up. It depends first of all on the level of pain which these persons can endure. Secondly, an alcoholic may have his mental processes sufficiently hindered so that he may not be aware of pain as ordinary persons would. I agree with you that in the majority of persons one of the most severe types of pain that occurs is from the perforated peptic ulcer.

Doctor Reed: One other question. You have ruled out lesions of the heart. I would like to ask you how common it is, in an external examination with the stethoscope, not to find any physical change in the heart when there is a true coronary occlusion with diaphragmatic irritation and periumbilical pain?

Doctor Hoffman: Well, without an electrocardiogram, it is impossible to make a definite diagnosis of a myocardial infarct from physical examination. The only thing that may help you is the appearance of a friction rub which frequently does not appear until a day or two after the onset of the disease. In pericarditis, you may see it early. There were no electrocardiograms taken in this case. The man's blood pressure was presumably not low, so that I think that it would be a very tenuous diagnosis.

Doctor Reed: Thank you very much, Doctor Hoffman. I think you have covered the differential diagnosis with the most likely diagnoses mentioned. I would like to have Doctor Chambers* discuss the neuropsychiatric aspects of this case at this time.

Doctor Chambers: The primary picture presented by this patient with reference to his neuropsychiatric status seems to me primarily that of a psychosis superimposed upon the physical difficulties which were of primary interest when he came in. It is easy to be conclusive as to what the psychic process was; it was delirium. It is a little bit more difficult to say what are the factors involved in the delirium itself. It was called delirium tremens when he was transferred to the neuro-

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psychiatric service; the background data for this is quite positive and the time sequence is quite correct; however, the broader scope of delirium in general has to be considered first.

The classic features which we would see in a delirium from any cause are: first, a state of clouded consciousness with defects of grasp and orientation of a fluctuating quality; and second, a state of distortion of reality which has been referred to by some authors as illusional, delusional, and hallucinatory. In this case the delirium is not clearly any one of these things, yet it borrows somewhat from all of them. In considering delirium in the broad sense, we must search for a combination of these two factors. A third factor in the clinical triad of delirium is an affective disturbance, usually that of fear; and it is to be noted that it is congruent to the mental content of the psychotic thought process of the moment. So much for delirium in general.

The specific basis, the causative agent, of this patient's delirium is a little bit less easily arrived at. With respect to the psychiatric consultation which occurred on the second day, there is a clear history of alcoholism referred to; I do not know whether that had been presumably available the entire time. There is no reason to doubt that this man had been a severe alcoholic. The effects of alcoholism on him and its contribution to the delirium are less clear. Presumably, he had quit drinking at the time of the onset of symptoms—it is not stated, but I definitely think it would follow—so that the period between that time and the onset of the psychotic state would be around 72 hours. In this interval we would expect to see withdrawal after steady drinking lead to psychosis in a susceptible person. Considering now the alcoholic causes, particularly of the delirium, a prodrome fits well with this picture also. The grand mal convulsion during a painful or unpleasant stimulus was consistent with this picture. It preceded the onset of psychosis by some 24 hours. The course of the psychosis is not necessarily pathognomonic but was consistent with delirium tremens. We note that the onset was late in the second day of hospitalization; the patient continued to be psychotic until some time not specifically stated, and by afternoon was referred to as speaking coherently. At this time he was again transferred to the medical service, and while there had another psychotic episode. This fluctuating state of the psychotic process is quite consistent with delirium tremens; however, against, if you will, the garden variety of delirium tremens is the mode of onset in this patient. The complaint of pain is by no means a frequent feature in delirium tremens and is suggestive, I think, that the delirium itself is on another basis, or is a superimposition. I am much more inclined to think that the delirium is due to multiple causes rather than due to alcoholic withdrawal. In the particular sensitivity found in alcoholic withdrawal pain itself is a stimulus to a delirious state. The evidences, the vital signs, and the hematologic findings raise the question of whether or not any infection existed; at least, the patient was under considerable stress from pain

and the physical process being experienced at the time. I think that it would have been an error to have said this is simple delirium tremens and nothing else. The psychiatric picture is that of the superimposition of an intercurrent delirium on a grave physical ailment. We cannot be sure as to whether this was delirium tremens or delirium from a combination of factors. I would tend to favor the latter myself, with alcohol probably having set the stage. In such an event, and without physical illnesses, this man might have had episodes of delirium tremens but would not have a prejudiced course as to physical illness. Any questions about the psychiatric status?

Doctor Gatto:* Do you think this man had grand mal epilepsy and may have been having attacks?

Doctor Chambers: I would not be particularly prone to think so. The convulsion itself is not infrequent in withdrawal as a prodrome to delirium tremens itself, and I think with this particular history that that is the thing you have to think of first, rather than any idiopathic epilepsy. I would not question that he did have grand mal convulsions at the times cited.

Doctor Gatto: It also appears that he had some generalized toxic condition.

Doctor Chambers: Yes, he certainly could, because that is the point I mentioned particularly—that this delirium has to be of somewhat unspecified causes. That it is a delirium is clear, but its course is less clear at this time. In either event, though, I would like to say this about delirium; that this is usually just an incidental finding superimposed on other pictures. Certainly it is not the major picture in this case; it is a complicating factor.

Doctor Reed: Doctor Chambers, could you exclude an abdominal crisis of syphilis with the history as stated?

Doctor Chambers: One would have to think of it, but that there are physical signs to accompany the pain, I think, allows us rather quickly to exclude that. The presence of fever, the suggestion of hemoconcentration in the initial laboratory work, plus the frank elevation of white blood cells—all could have been due to hemoconcentration. Fever and the steady quality of the pain are also somewhat against it; elevated blood pressure is against it as well. It is infrequent that you find these physical findings with the gastric crisis alone.

Doctor Reed: Thank you very much, Doctor Chambers. I would like to ask Doctor Aiken** to review the surgical aspects of this case for us.

Doctor Aiken: I would like to say that I agree with Doctor Hoffman in dismissing pancreatitis, although with a few slight reservations, as a cause of this man's death, and also I agree with him in dismissing

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**Maj. David W. Aiken, USAF (MC), Chief, General Surgical Section, Surgical Service.

other intra-abdominal conditions that he mentioned and dismissed. This patient died of a fulminating infection. I believe there is considerable evidence in the physical examination and description of the hospital course to show that he did not have a significant degree of peritonitis. On a number of occasions, apparently, rather deep palpation into the abdomen was possible, sufficiently to outline the border of the liver. I think that the rectal examination showing some tenderness high may not be significant as regards peritonitis because apparently the patient reacted to what is a severe stimulus in that type of examination. Just as Doctor Hoffman is willing to accept the negative x-ray evidence for the diagnosis of perforated peptic ulcer, so I am willing to eliminate that possibility.

Speaking of fulminating infection and the enlarged liver, I suppose we should mention, although in a negative fashion, acute septic pylephlebitis of the liver, which is nearly always secondary to some infection in some organ of the abdomen. I believe that this patient falls fairly clearly, although with some reservations which I will mention, into that group of patients who die from perforation of the lower esophagus. There is a diagnostic category called spontaneous perforation of the esophagus, so-called because no pathologic condition is found at the site of perforation. I think that probably this patient falls into that category. The majority of such patients are alcoholics; they come in with histories of severe epigastric pain going through to the back, and there is usually a history of vomiting. However, there does not have to be a history of vomiting, and spontaneous ruptures of the esophagus have occurred following straining at stool, lifting of a heavy weight, labor and delivery, and particularly after a grand mal epileptic seizure.

The statement in the history, however, that he had associated nausea and gagging indicates to me that undoubtedly intra-esophageal pressure was increased enough to cause a rupture. The usual course of this condition is that a severe fulminating, always fatal mediastinitis develops. Now this would explain the pain and stiffness in the neck, and possibly even the redness in the throat, if it got that high. One of the reservations that I have to make in this diagnosis is the fact that we do not have any concrete evidence of its rupturing into a pleural cavity, which nearly always but not absolutely always happens. There certainly was plenty of dullness and decreased breath sounds mentioned which could go along with fluid in a pleural cavity. You would expect that rales or gurgles would have been heard, but I am willing to overlook this in going out on a limb for diagnosis.

In regard to the use of the Miller-Abbott tube for a dilated large bowel, I would like to mention that apparently the physicians who used the tube were doing so as a last resort. They probably really did not believe that the tube would effectively decompress the dilated large bowel. The only way to decompress an obstructed large bowel is by

cecostomy or transverse colostomy, and certainly they did not believe they had a strong enough case to warrant those measures, so it was just thrown in because nothing else was being effective. I note there was right upper quadrant tenderness upon compression of the right side of the chest. Frequently, patients with this condition have an abdomen which is actually boardlike, which he apparently did not have; or if he did, it relaxed from time to time, particularly after a grand mal type of seizure. In regard to this condition, there are probably many more than a dozen cases that have now been reported in the literature as having been diagnosed antemortem and operated on with recovery, and perhaps 200 or 300 fatal cases reported.

The operative treatment is to open the chest, the left chest probably, close the perforation, drain the mediastinum into the pleural cavity, and then drain the pleural cavity. I do not think anybody is doing mediastinotomies to relieve this area of infection from this condition. I suppose there are other lower esophageal lesions I should mention as possible causes of perforation. Ulcerations do occur in hiatus hernia. Pulsion diverticula do not commonly perforate, they simply enlarge and cause symptoms of obstruction. Are there any questions?

Doctor Tobin: Why did you rule out acute pancreatitis so quickly?

Doctor Aiken: Because I am willing to accept the serum amylase level of 85 as being just slightly over the normal limit, and I like to have a really good amylase level to make that diagnosis.

Doctor Tobin: In acute pancreatitis, the serum amylase may be elevated early and fall rapidly.

Doctor Aiken: It may come down rather rapidly, that is true. It is a difficult diagnosis to make without the elevated amylase, and I simply think that there is enough evidence to point toward my diagnosis, so that I am willing to explain it all on that basis. Of course, alcoholism and pancreatitis very commonly go together. Maybe he had that too.

Doctor Reed: Doctor Aiken, do you find x-ray evidence of perforation of the esophagus, such as widened mediastinum?

Doctor Aiken: Not necessarily.

Doctor Reed: Splinting of the diaphragm?

Doctor Aiken: Well, I don't know . . .

Doctor Claypool: Yes, you usually find a widened mediastinum, although I am sure there are cases of rupture of the esophagus in which you will not find evidence of mediastinitis. Another common x-ray finding in this condition is mediastinal emphysema. There is no evidence of these findings in this case.

Doctor Aiken: The most recent good article on this is one by Mackler.[1] I may be a little bit prejudiced on the diagnosis because one other

article I refer to was in the Hartford Hospital Bulletin seven years ago, by Aiken and Lampson.[2]

Doctor Reed: Thank you very much, Doctor Aiken, for that interesting discussion on perforation of the lower esophagus. Doctor Gatto, would you care to comment on this case?

Doctor Gatto: During this patient's rapid downhill course, he had increasingly severe symptoms which involved not only his abdomen and his central nervous system, but also his vascular system. I am impressed by the generalized toxicity that the patient demonstrated. His pulse climbed to 168, his heart sounds were distant, and he appeared to be in severe shock. He showed definite signs of meningeal irritation or cerebral involvement. Because the history gave no complete neurologic examination, one cannot be sure what neurologic findings there might have been. One can, however, perform a neurologic examination on unconscious patients, or even disturbed patients, with some degree of accuracy and understanding. This should be done repeatedly in such cases as this one.

The development of a psychosis during the course of severe organic disease often creates a dilemma. The question frequently arises, "Where is the patient best treated?" In general, it would be true that if the neuropsychiatric facility has excellent medical facilities itself, together with personnel who understand the nursing care of physically sick as well as psychiatrically disturbed patients, then it is possible for a patient to be treated on a psychiatric service; however, when such care is not available and a patient develops a psychosis during the course of an illness which requires specific and constant medical care, it may be best to keep him on the service in charge of his case and seek psychiatric assistance to follow his mental status and to provide psychiatric therapy that may be needed. I say this advisedly because of what I have known in the past to have happened to certain persons who developed psychoses and were too quickly transferred to psychiatric services without true evaluation of their underlying organic condition. The discovery of individual brain tumors on a psychiatric service is not uncommon. I remember further the case of a patient who had severe bilateral pneumoconiosis underlying a psychosis, and who would have done much better if he had been on a medical ward receiving oxygen than on a psychiatric service being treated as a schizophrenic. The decision as to the proper location for the treatment of this patient was obviously of importance in his treatment. The fact that he had an alcoholic background perhaps confused the issue, leading to his too early transfer to the psychiatric service with the diagnosis of simple alcoholic withdrawal; however, the degree of severe, generalized abdominal distress and the severe delirium appear to have been far in excess of what we commonly see in alcoholic withdrawal and delirium tremens. Doctor Chamber's discussion aptly indicates that this delirium was definitely of a toxic or infectious nature, which perhaps was only

influenced by the earlier physiologic dependence on alcohol. I must point out that in this patient the use of barbiturates for sedation was not advisable. Perhaps paraldehyde would have been more useful for sedation and also for preventing further confusion of his clinical picture. I would like to raise one point in view of what appears to be a generalized toxic picture. Is there any other generalized organic condition that should be considered in this patient? Sometimes, following alcoholic debauches or debilitation, overwhelming infectious or toxic reactions may occur which seem to present generalized clinical pictures very much like the Waterhouse-Friderichsen syndrome, in which many systems are involved and physiologic mechanisms are greatly impaired. I wonder if we may hear a few words on this.

Doctor Hoffman: I am not familiar with the Waterhouse-Friderichsen in association with acute alcoholism. The usual causes are septicemia due to *Neisseria intracellularis* and occasionally to *Hemophilus influenzae,* in which one sees widespread destruction of the adrenal cortex. Usually, the clinical manifestations are shock and severe purpura. I do not think this patient fits into that category at all.

Doctor Baird:* I would like to ask you if you had considered the diagnosis of carbon tetrachloride poisoning?

Doctor Hoffman: Usually with carbon tetrachloride poisoning you expect a lot more in the way of findings. Early there is oliguria with azotemia and, in fatal cases, uremia and/or evidences of toxic hepatitis. You expect elevation of the blood urea nitrogen, and you might see severe hematuria. Of course, carbon tetrachloride can pick out either the liver or the kidney, or both, and just on the basis of what we have here I do not think that we can say clinically that this man had carbon tetrachloride poisoning.

Doctor Gaensler:** Concerning Doctor Aiken's remarks, I would not consider the diagnosis of perforated esophagus. In the patients I have had an opportunity to see, there was a very definite, sudden onset. They coughed, retched, vomited, or had a bowel movement, and felt a sudden, sharp pain in the chest; there was no question about the onset. The pain was in the anterior and posterior chest, or was pleuritic, and was not primarily an abdominal pain. There were no abdominal findings in these patients. I have heard of cases where there were no perforations into the pleural cavity, although those patients I have seen did have perforation into the left pleural cavity and had a large pneumothorax. In some, the chest was filled with fluid and esophageal contents. I can concede it possible that the pleuras are not perforated, but any patient who does not have a pneumothorax and does not have air in the mediastinum does not have perforation of the esophagus. The mediastinum in this region is very soft and the pressure relationship between esophagus and mediastinum would attract air into the

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mediastinum. Chest roentgenograms of this patient on 18 and 19 February were negative, and there never were any findings primarily referable to the chest. Of the many diagnoses that could be considered, I would think of perforation of the esophagus last.

Dr. Hoffman's diagnoses:

1. Perforated peptic ulcer
2. Fatty infiltration of liver
3. Aspiration pneumonitis

Dr. Aiken's diagnosis:

1. Perforation of lower esophagus

PATHOLOGIC FINDINGS

Doctor Reed: This patient had an acute hemorrhagic necrotizing pancreatitis with extensive involvement of the abdominal fat and mesentery. The pancreas was enveloped in a capsule of blood, and large areas of necrosis stretched from the midportion of the pancreas down along the left abdominal gutter and followed the descending colon to the pelvis, indicating extensive lipase activity and intra-abdominal chemical toxicity. Other gross findings were moderate bilateral hydrothorax, aspiration of vomitus, and myocardial dilatation. The liver was definitely enlarged, weighing 2,750 grams, and was quite pale, yellow, and smooth. There was no evidence of cholelithiasis and there were no calculi in the pancreatic ducts. Microscopic sections of the pancreas showed necrosis of blood vessel walls and pancreatic tissue. The sections of the liver showed marked fatty changes involving all sections of the lobules. The lungs showed an area of pneumonitis.

In retrospect, I might say that the clinical evidence for acute hemorrhagic pancreatitis can be found in the history, but when a physician is confronted with the type of clinical picture here it can be very difficult to decide on one definite diagnosis.

Pathologic diagnoses:

1. Acute hemorrhagic pancreatitis
2. Fatty degeneration of liver
3. Pneumonitis

Doctor Tobin: When this patient entered the hospital everyone thought he obviously had an acute abdomen, but the diagnosis became less obvious as time went one, particularly after the convulsion. The combination of convulsion, stiff neck, and delirium suggested the possibility of meningitis.

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Atypical Lower Nephron Nephrosis

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MANY AUTHORS[1-6] have stressed as cardinal signs of the acute phase of lower nephron nephrosis antecedent shock followed by oliguria, hypertension, proteinuria, and excretion of granular or pigment casts in the urine. Likewise, they correlate clinically the rapid elevation of nonprotein nitrogen and serum potassium in the patient displaying full-blown symptoms of uremia. If the patient survives the anuric phase of the disease he progresses to the diuretic or recovery phase during which large amounts of urine and electrolytes will be excreted. The serum potassium and sodium levels drop followed by a gradual fall in nonprotein nitrogen and, if proper safeguards are not taken, a salt depletion syndrome may develop.[7]

The following is an atypical case of lower nephron nephrosis in that the acute phase of the disease was never clinically evident. The patient died during the diuretic phase with hyperkalemia and azotemia.

CASE REPORT

A 25-year-old soldier was injured in an aircraft accident at 0300 hours on 14 April 1953. About 15 hours elapsed before he received medical aid. He was in shock when examined at the site of the wreckage. The blood pressure was 90/60 mm. Hg; pulse, 100; and the skin was pale and clammy. He had several large lacerations about the face and head with bilateral periorbital hematomas. Complete paraplegia from the level of the first lumbar vertebra was present with abrasions over the spine at this level. Several large contusions were visible over the sternum. An indwelling catheter was inserted into the bladder but no urine was obtained. The patient received 1,000 cc. of whole blood, 1,000 cc. of dextran, and 10 mg. of morphine while at the wreckage and en route to the hospital. On his arrival at this hospital he began excreting small amounts of amber-colored urine which was immediately sent to the laboratory for analysis. The patient's sensorium was now clear, his skin was warm, and he appeared fairly well hydrated.

Laboratory Data on Admission. The hematocrit was 35 percent; hemoglobin, 11 grams per 100 cc.; and the white blood cell count,

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11,200 with 90 percent neutrophils and 10 percent lymphocytes per cubic millimeter. Urinalysis revealed amber color, acid reaction, 1.010 specific gravity, a trace of albumin, an occasional white blood cell, and from 10 to 12 red blood cells per microscopic high-powered field. No casts were observed. A markedly impacted fracture of the body of the first lumbar vertebra and complete disruption of the pedicular and neural arch structures of the first lumbar vertebra with disturbed relationship of the interspaces in this area were demonstrable by roentgenograms. There was also a fracture of the inferior portion of the body of the sternum at the junction with the xiphoid.

Course in the Hospital. Shortly after admission the patient was taken to the operating room where his face was cleansed and sutured. A laminectomy revealed marked compression and maceration of the cord at the level of the first lumbar vertebra. Loose fragments of bone were removed and the incision closed. He received 500 cc. of whole blood during the procedure and left the operating room in good condition. He was placed on a Stryker frame and given antibiotics, intravenous fluids, and a booster injection of tetanus toxoid.

During the next 24 hours the patient improved considerably. His blood pressure and pulse were normal, he was taking clear fluids by mouth and his 24-hour urinary output increased to 1,500 cc. Repeat urinalysis obtained from an indwelling catheter showed a specific gravity of 1.012, one plus albumin, occasional white blood cells, and from six to eight red blood cells per high-powered field. Between 15 and 22 April the patient showed progressive improvement. His urinary output varied from 1,500 to 2,000 cc. per day. He was afebrile, comfortable, receiving visitors for short periods of time, and eating a regular diet. On the afternoon of 22 April the patient became apprehensive and complained of a cough which was productive of minimal amounts of old blood. For the first time a pericardial friction rub was noted over the apex. Because of his sternal fracture an electrocardiogram and a roentgenogram of the chest were made. The roentgenogram showed no change. The electrocardiographic findings were suggestive of hyperkalemia. His urinary output remained at 1,500 cc. and his oral intake was excellent. On the evening of 23 April the patient became dyspneic and disoriented and developed cyanosis limited to his neck and the upper part of his chest. The diagnosis of a superior vena cava syndrome was considered; however, venous pressure and circulation times were normal. The chest was clear clinically and on roentgenographic examination. Repeat electrocardiograms showed severe hyperkalemia. Hematocrit was 34 percent and the hemoglobin was 9.8 grams per 100 cc. The blood pressure and pulse remained normal. Serum potassium was 8.7; serum sodium, 128; chlorides, 93; and the carbon dioxide capacity was 18.7, all in mEq./L. The blood urea nitrogen was 245 mg. per 100 cc. Unfortunately urine electrolyte studies were not available.

A tentative diagnosis of lower nephron nephrosis was made even though the patient's urinary output remained high except for the first 24 hours after his injury, 10 days before.

Figure 1. Hemisections of the kidneys showing intense congestion of medullary pyramids and pole, and swollen cortices.

Ten percent dextrose solution with insulin were immediately started, the patient's head was elevated, and oxygen was given by catheter and tent. His urinary output was measured hourly and never dropped below 75 cc. per hour until death. Fluids were carefully administered intravenously so as not to overhydrate the patient. On 24 April, jejunal perfusion was begun, after the method of Kelly and Hill,[8] in an effort to reduce the serum potassium. The perfusion fluid (1,200 cc.) was given by tube over a six-hour period and 1,150 cc. aspirated back. However, because the patient developed dependent edema and early pulmonary edema, all infusions were stopped. At 0200 hours, 25 April, the patient died, 11 days after his injury.

Necropsy Examination. *Gross examination.* Gross postmortem examination revealed essentially the following: Pulmonary edema, kidneys which were overweight and edematous showing dusky medullae consistent with lower nephron nephrosis (fig. 1), crushed lower lumbar portion of the spinal cord, a fractured sternum, and extensive hemorrhage within the pectoralis major and minor muscles, iliopsoas and sacrospinalis group of muscles.

Microscopic examination. On microscopic examination within the cortex of the kidneys numerous areas of tubular degeneration were

noted. This was present throughout the cortex and involved principally the distal convoluted tubules and casts were present within these sectors. Areas of tubular interstitial rupture were seen and thrombi into veins within the ascending loop of Henle and collecting tubules were noted. Scarring in many areas was interpreted as an indication of healing (fig. 2). The lung showed a marked degree of edema and hemorrhage within the alveolar spaces. Masses of macrophages, typical of "heart failure cells," were present within the alveoli. Sections of the heart disclosed a slight amount of edema but no fibrosis or hemorrhage.

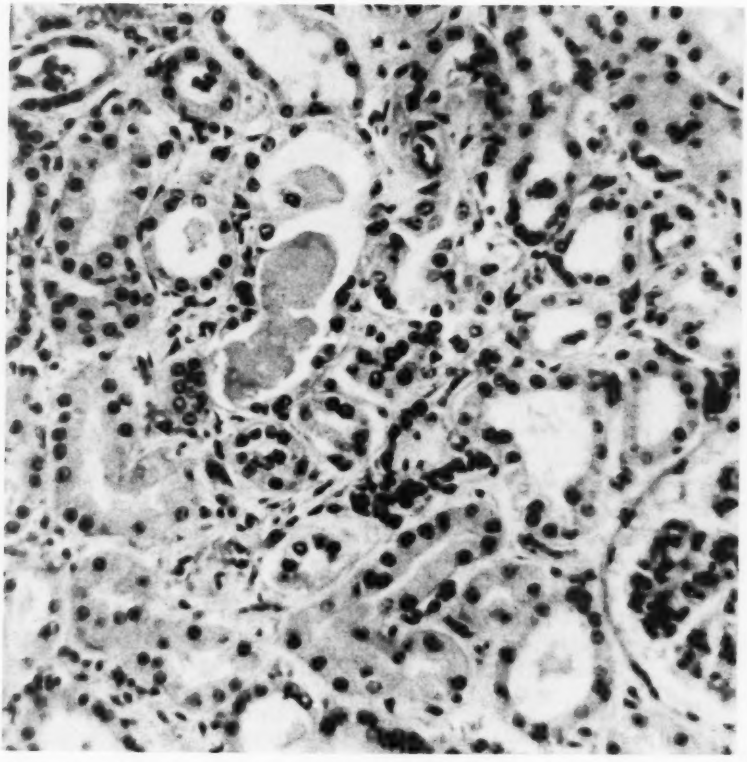

Figure 2. Photomicrograph of a section of the kidney showing hyaline and pigment casts and scattered areas of tubular epithelium regeneration.

DISCUSSION

This patient presented many unusual manifestations of lower nephron nephrosis.

The patient was anuric for 15 hours following his injury but his urinary output reached normal levels on the second day and

remained high until the hour of his death, 11 days later. No granular or pigment casts were observed in his urine and the relatively few red blood cells were attributed to the indwelling catheter. He did not develop evidence of hypertension, although this may have been due to his paraplegia and concomitant loss of sympathetic tone. His relatively benign course between the second and ninth day was likewise unusual. Thus, of the various clinical, urinary, and vascular signs which Lucké[3] described, anuria was present for only a short time.

Because the patient died during the diuretic phase of the disease, it is difficult to account for the extremely high serum potassium in the face of high urinary output. As far as we know this is the only patient with this disease in whom the serum potassium continued to rise to high levels during the diuretic stage.[7,9,10] Indeed, the excessive potassium and sodium loss during this period is usually stressed in the literature. Moyer[11] stated that "because the rate of excretion of potassium salts by the kidney is extremely rapid, compared to that of sodium salts, potassium excesses do not occur spontaneously unless oligura or anuria is present."

We postulate two mechanisms for this unusual occurrence:

1. The vast amount of direct tissue destruction which the patient sustained, coupled with the loss of muscle substance as a result of the paraplegic state, conspired to release tremendous amounts of potassium and other products of protein catabolism into the extracellular compartment, which the kidneys, in their damaged state, could not clear even with ordinarily adequate urine volume.

2. The second possibility, admittedly remote, would be a selective reabsorption of potassium by the damaged tubules. We are not aware that such a mechanism has ever been described. The adrenals do not appear to be implicated because no evidence of adrenal insufficiency, either clinically or on necropsy was found.

We believe that this patient might have survived had his precarious condition been discovered earlier. An infusion of calcium salts or hypertonic sodium chloride might have prolonged his life until an artificial kidney could have been secured and used.

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THE MEDICINE OF TOMORROW

Starting with undergraduate teaching, the medical student must be indoctrinated by example as well as precept to the glamour and warm inner satisfaction that comes from aiding the chronically ill individual to meet his total life needs. He must learn to get an ego glow from taking the old hemiplegic out of a wet bed, teaching him to walk and to talk, to meet the needs of daily living and to live outside an institution, and to be a person again. These accomplishments must give him the same satisfaction that he now gets from making a diagnosis of favism or anthrax.

If he does not develop such a feeling of inward satisfaction, much of his professional life will be frustration. Whether he likes it or not, the average general practitioner now spends three quarters of his time treating patients who are chronically ill or who have emotional problems involving social, marital, or economic pressures. This percentage will undoubtedly increase continually in the future.

When the medical student or young physician reaches the point of feeling a deep sense of accomplishment from his efforts to aid the chronically ill and disabled, then he ceases to be a technician and becomes a physician in the true sense of the word, for then he treats people rather than diseases.

—HOWARD RUSK, M. D.
in *Journal of Chronic Diseases,*
pp. 88-89, Jan., 1955

Chromoblastomycosis

Laboratory Observations on the Causative Organism

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CHROMOBLASTOMYCOSIS is a chronic, infectious, apparently noncontagious disease of the skin and subcutaneous tissue caused by several species of related fungi. Although the name, chromoblastomycosis, has been accepted by most authors, the names given the causative organism have not been uniform. Conant and Martin[1] and Carrion[2] have discussed this problem and attempted to clarify the nomenclature. The terminology of Carrion is used here.

By 1947, Carrion had collected 159 cases of chromoblastomycosis from the world literature. At that time 80 percent were from the tropics or subtropics, and 20 percent were from the temperate zones; only nine cases were from the United States. By 1954, the twenty-second case of chromoblastomycosis had been reported from this country—the last nine from a single area in Louisiana.[3]

Chromoblastomycosis has a slow clinical course and usually involves the skin of the extremities, rarely the skin of the face or trunk, and even more rarely the deeper tissues.[4] It has been found only in adults, and 96 percent of the reported cases are in men.[2] Its several clinical types were classified by Pardo-Castello and associates[5] into verrucous, tuberculoid, syphiloid, psoriasiform, cicatricial, and elephantiasic forms, according to the gross appearance of the involved skin. The species of causative organism does not correlate uniformly with any particular clinical form of the disease.[6]

The disease is usually treated surgically. Excision or electrocoagulation and curettage have been used successfully for many cases;[5,7] but the cicatricial and elephantiasic forms may require amputation.[5] Pardo-Castello and associates used roentgen-ray therapy (from 600 to 1,200 r. u. filtered through 2 mm. of aluminum) successfully in a few patients with limited involvement. Iodides, thymol,[5] neoarsphenamine, and pentamidine[7] appear to have little effect.

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Yew,[8] in a preliminary report, indicated regression of numerous lesions in one patient following oral and intravenous sodium iodide, moist copper sulfate compresses, and the local application of an ointment containing seven percent chrysarobin, five percent salicylic acid, and five percent phenol. Whether cure was obtained or not was not reported.

In recent in vitro studies of the fungistatic activity of various chemicals, Bocobo and associates[9] found that certain diamidines in concentrations of from 10 to 100 μg. per ml. of culture medium inhibited the growth of *Hormodendrum pedrosoi (Fonsecaea pedrosoi)* and *Phialophora verrucosa*.

CASE REPORT

A 36-year-old boiler tender in 1947, while in Italy, noticed for the first time a round, reddened, scaling painless area about one centimeter in diameter involving the skin just above the posterior aspect of the left elbow. The lesion gradually enlarged until, at the time of his admission to this hospital on 26 April 1954, it measured 10 by 7.8 cm. (fig. 1). During the patient's 17 years of service in the Navy, he had visited many ports. He was in China and the Philippines from 1937 to 1940; he made several stays in Cuba from 1942 to 1944; and he visited numerous South Pacific islands from 1944 to 1945. He was unable to recall an injury to the involved area of skin at any time during his naval service.

The lesion (fig. 1) was a raised, erythematous, slightly scaly, well-demarcated, irregular plaque with an elevated border. Scattered areas of nonelevated, normal-appearing skin measuring from five to eight millimeters in diameter were present within the borders of the involved area, and other physical and laboratory examination findings were within normal limits.

A small piece of skin from the edge of the involved area was excised on 18 May 1954 for microtechnical processing and mycologic and bacteriologic examination.

Histologic Examination. Microscopic examination of sections of the specimen of skin presented varying degrees of irregular acanthosis; broadening, deepening, and distortion of the rete pegs; and hyperkeratosis of the epidermis. The immediately underlying dermis was involved by a noncaseating granuloma in which lymphocytes, epithelioid cells, Langhans' giant cells, and nests of neutrophils were abundant (fig. 2). The deeper dermis was not involved in this process. Scattered through the involved tissue and occasionally present within the giant cells were small numbers of brownish, spherical to slightly oval, thick-walled, occasionally septate bodies measuring from six to 18 microns in diameter (fig. 3). These were visible in unstained preparations as well as in hematoxylin-eosin stained sections; and they stained with fuchsin using the periodate-Schiff reagents.

Mycologic Examination. Culture of a portion of the biopsy specimen on beef extract blood agar, Littman's oxgall agar and on Sabouraud's agar produced growths typical of *F. pedrosoi,* variety communis[2] (fig. 4).

Figure 1. Appearance of patient's left elbow on his admission to the hospital.

Fermentation studies were carried out on this organism, using the following sugars: dextrose, levulose, galactose, maltose, sucrose, lactose, and mannitol.

No gas was produced in any of the sugars used. No acid was produced in lactose or mannitol. Acid was produced, however, in dextrose, galactose, sucrose, levulose, and maltose.

Animal Inoculation. Twelve white male mice and six white female rabbits were inoculated with a two percent weight in volume suspension in physiologic saline solution utilizing a 14-day-old subculture from a primary isolate on Sabouraud's dextrose agar. One half of the mice and rabbits were injected subcutaneously with viable material and the rest with autoclaved material; all animals were sacrificed after eight weeks. Histologically the mice showed abscess cavities filled with cellular debris, brownish fragmented hyphal elements and small (four

to six microns in diameter) spores together with macrophages and polymorphonucleocytes. There was no evidence of a granuloma. Cultures of this material from the animals who received the viable inoculum yielded heavy growths of the organism under study. Cultures from the mice receiving the autoclaved inoculum were negative. Five of the six rabbits were negative on gross inspection and on histologic and mycologic

Figure 2. Section of tissue showing sharp, deep border of the granuloma. (× 90)

examination. One of the rabbits had been given 0.1 ml. of the viable material intradermally. It developed a palpable nodule which histologically appeared similar to the abscess cavities seen in the mice. Culture of this abscess was negative.

Diamidine Sensitivity. In view of the reported evidence that certain diamidines exert an inhibitory influence on the growth of the causative mold of chromoblastomycosis,[9] it was decided to test the effect in vitro of one of these agents, namely, propamidine, against the subject organism.

Consequently, graded amounts of the isethionate salt of propamidine dissolved in water were incorporated into Sabouraud's dextrose agar at a temperature of 45° C., and pour-plates were made. The following concentrations of propamidine were prepared in duplicate sets of plates: 0.5, 1, 2, 5, and 10 μg. per ml. of culture medium. In addition, the solvent (water) was added to the contents of each of one set of plates in amounts equal to that used to dissolve the propamidine added to each of the other pour-plates. The surface of each plate was inocu-

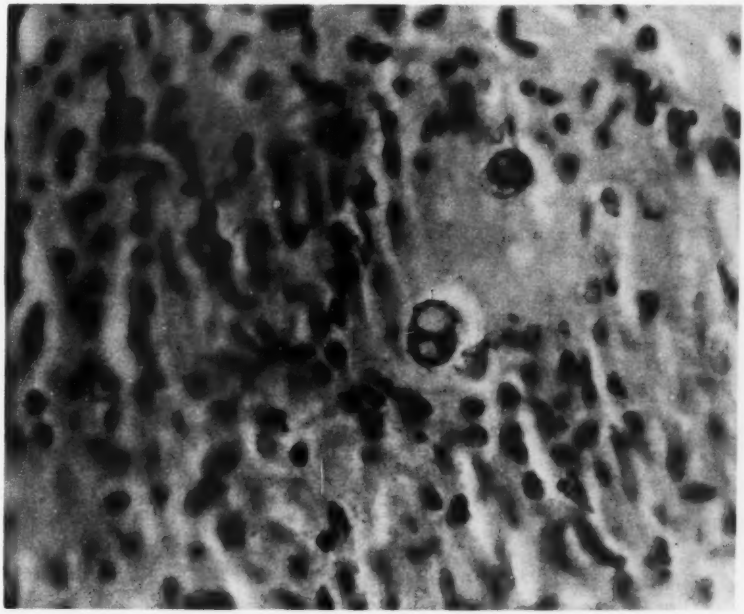

Figure 3. Section of tissue showing Langhans' type giant cell with included tissue phase of the causative organism. (× 740)

lated with 0.3 ml. of a five percent emulsion weight in volume in physiologic saline solution of the mycelial phase of the test organism. The plates were kept at room temperature and inspected every other day for three weeks.

At the end of one week there was heavy, confluent growth on the plates containing the solvent and those containing 0.5 and one microgram per ml. of propamidine. Slight growth in the form of a few minute colonies was evident at the two micrograms per ml. concentration of propamidine. No growth was discerned at the higher concentrations. There was no change in the appearance of the plates at the end of two more weeks.

Bacteriologic Examination. Cultures of the second biopsy specimen were negative for brucella, actinomyces, and nocardia. A guinea pig inoculation was negative for tuberculosis or other infectious disease.

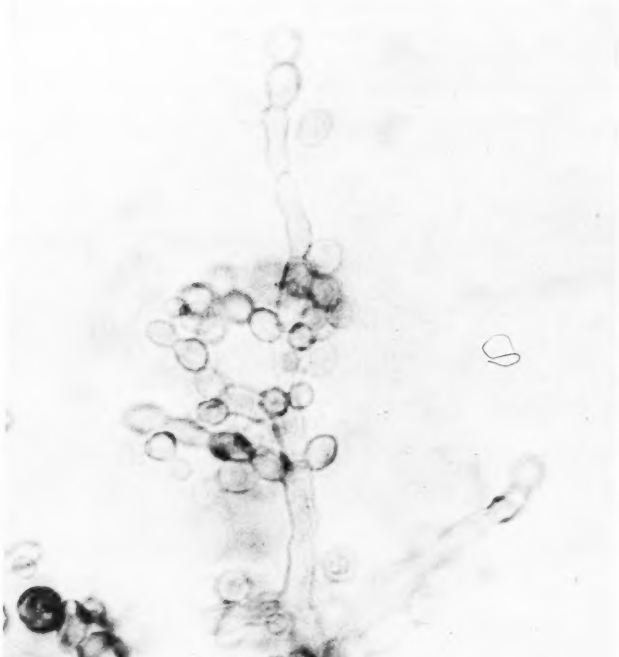

Figure 4. Branching septate terminal hypha with branching spore chains. Several larger dislocated thick-walled spores are seen at the lower left. (× 1,000)

Treatment. Bocobo and associates found inhibition in vitro of *H. pedrosoi* in a minimum concentration of one milligram of either diethylstilbesterol or methyltestosterone per ml. of culture medium. Dosages required to accomplish this concentration in body fluids would be expected to produce prominent undesirable hormonal effect.

The diamidines were found by Bocobo and associates to inhibit growth of their strains in a concentration of 0.01 mg. per ml. in the case of stilbamidine; 0.1 mg. per ml. in the case of pentamidine; and 0.1 mg. per ml. in the case of propamidine.

In our organism, propamidine caused inhibition of growth in a concentration of 0.005 mg. per ml. of culture media, showing, therefore,

considerably greater sensitivity to propamidine than the strain used by Bocobo.

Because of the expense of the drug and the size and location of the lesion, surgical excision plus a skin graft was considered to be the treatment of choice in this case.

We believe, however, that chemotherapy may have a real place in the treatment of chromoblastomycosis where the lesions are multiple or too extensive to lend themselves to excision and grafting. Sensitivity studies are worth while if chemotherapy is to be considered. In our patient propamidine probably would have been the drug of choice if the lesion had been less amenable to surgery.

DISCUSSION

Chromoblastomycosis apparently is caused, in the majority of cases, by accidental inoculation of the skin with the causative fungus. That the disease may be produced by cutaneous inoculation was demonstrated by Azulay,[10] who introduced, by scarification, two drops of a saline suspension of the organism into the skin of a volunteer human being. In three months the volunteer had developed a progressively enlarging lesion 15 cm. in diameter which, over a year's time, became verrucous.

Animal inoculation has been carried out in the case of rats, mice, rabbits, dogs, monkeys, guinea pigs, pigeons, and frogs with apparent success in all but the last two.[2] Rats and mice are reported to be most susceptible by the peritoneal, subcutaneous, and testicular routes.[2] Azulay reported production of granulomas by the testicular route in guinea pigs and rats, but, in his hands, the subcutaneous and peritoneal routes were unsuccessful.[10] We also were unable to produce the disease in female rabbits by cutaneous or subcutaneous routes or in male mice by subcutaneous injection. It is of interest that Conant and Martin, injecting three series of live suspensions of four strains of fungi causing chromoblastomycosis subcutaneously into rabbits, produced circulating antibodies and reactive nodules but did not produce the disease. As shown from our own work, the organism may be isolated for a short period from the site of inoculation. This we do not regard as proof of disease production but rather as a demonstration of the hardiness of the fungus. We are further impressed by the similarity of the lesions produced by injection of sterile control suspensions to those produced by suspensions of the living organism.

Fermentation studies by de Montemayor[11] were performed on six strains of fungi causing chromoblastomycosis as well as strains of several other fungi. He found that organisms causing chromoblastomycosis grew best at 37° C. and produced acid in

glucose, maltose, sucrose, and galactose, but not in lactose. Our fermentation studies are in agreement.

Serologic studies to determine antibodies against this organism were not carried out.

SUMMARY

A 36-year-old man had chromoblastomycosis of the skin of the left elbow since 1947. Histologically, the involved skin was the site of granulomatous inflammation and contained brownish, spherical, septate bodies. *Fonsecaea pedrosoi* was isolated from an emulsion of the diseased skin. Attempts to produce the disease by cutaneous and subcutaneous injection of a saline suspension of the organism into rabbits and by subcutaneous injection into mice were unsuccessful. The organism produced acid without gas in dextrose, galactose, maltose, sucrose, and levulose, but not in lactose or mannitol. In vitro sensitivity studies were done, using propamidine, and growth of the fungus was found to be inhibited by a concentration of 0.005 mg. per ml. of culture medium by this agent. The patient was treated by surgical excision of the lesion, followed by the application of a split-skin graft.

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Epidermoid Cyst of the Testis

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BENIGN testicular tumors have been regarded as rare. Herbut[1] stated that they constitute from two to four percent of all testicular neoplasms. Mostofi,[2] however, stated that testicular epidermoid cysts are more common than was previously thought. He had observed a yearly average of two or three patients with this lesion.

Testicular tissue, being totipotential, gives rise to a variety of neoplasms. The inciting agents are unknown. In the case here reported, a history of recurrent urinary infection was obtained. Infection, therefore, might have played a part in the pathogenesis of this cyst. Either metaplasia of the testicular epithelium or development of so-called cell rests has been assumed to explain the occurrence of tumors of the testis. Nagel and Polley[3] have presented an interesting discussion of the pathogenesis of testicular dermoids; epidermoid cysts are generally considered a variant of this neoplasm.

The clinical problem in managing testicular masses is differentiating the malignant from the benign before removal. Because most are malignant, total orchiectomy should be done in doubtful instances. In the cases reported by Cook and Kimbrough[4] differentiation was made by palpation of the surgically exposed testis.

CASE REPORT

A 22-year-old man was admitted to this hospital for study on 24 February 1954. Two weeks before admission he had noted a swelling in his right testicle, followed by pain some time later. He also stated that albumin had been found in his urine previously. The remainder of the history was negative, except for repeated episodes of sinusitis and urinary infection in the past. On fist percussion he had bilateral tenderness over the kidneys. There was an indurated, localized, tender mass, about one centimeter in its greatest diameter, on the lateral aspect of the right epididymis, midway between the epididymal head and tail.

Results of blood studies, including an erythrocyte sedimentation rate and serologic test for syphilis, and of a urinalysis were normal. A roentgenogram of the chest and an intravenous urogram showed

From U. S. Army Hospital, Camp Chaffee, Ark.

normal findings. Culture of the urine recovered beta-hemolytic staphylococci (coagulase negative). A urinary smear for *Mycobacterium tuberculosis* was negative.

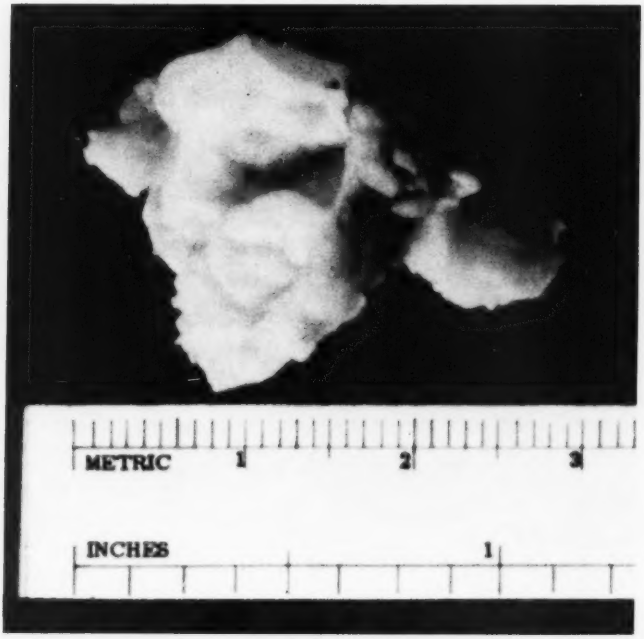

Figure 1. Epidermoid cyst of testis with a thick connective tissue wall. (Slightly enlarged)

To establish a diagnosis, the right testis was surgically explored on 26 February. The mass proved to be a cyst surrounded by seminiferous tubules. It was separated easily from surrounding tissue by blunt dissection. On section, the cavity contained a white, waxy material. Because the lesion resembled a sebaceous cyst, and was circumscribed and easily removable, simple closure of the incision, in layers, was accomplished. Healing was rapid and postoperative findings six weeks later were normal.

Gross and Microscopic Examination. Grossly, the specimen was a thick-walled cyst measuring 1.5 cm. in diameter and filled with the usual laminated yellowish greasy material. The testicular tissue surrounding the cyst appeared normal (fig. 1).

On microscopic examination, the wall of the cyst was found to be composed of dense connective tissue. The outer portion of the wall showed moderate to marked chronic inflammatory infiltration. The

cyst was lined by stratified squamous epithelium which was present in only a few areas of the wall (fig. 2). The content of the cyst was composed of layered keratin.

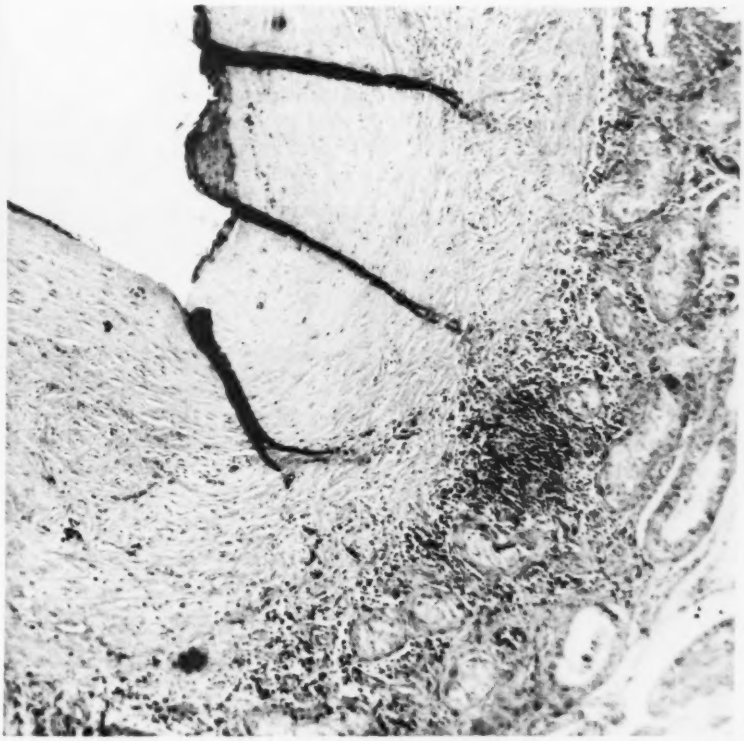

Figure 2. Photomicrograph of the wall of the cyst. The lower corner shows an area of chronic inflammatory infiltration within the wall and nearby testicular tissue. Small areas of squamous stratified epithelium line the wall. (× 75)

SUMMARY

In presenting a case report of a patient with benign testicular tumor, removal of which was possible without sacrificing the testis, it is emphasized that most testicular masses are malignant and should be regarded as such until proved otherwise.

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DR. EDWARD H. CUSHING, NAVAL RESERVE OFFICER, NAMED DEPUTY TO DR. BERRY

A Washington, D. C., physician with Army service in World War I and naval service in World War II is the first Deputy Assistant Secretary of Defense (Health and Medical). Dr. Edward H. Cushing, who has been a captain in the Medical Corps, U. S. Naval Reserve, since 1940, took the oath of office in a Pentagon ceremony on 3 March 1955.

Dr. Edward H. Cushing, right, is shown being sworn in as Deputy to Dr. Frank B. Berry, center, Assistant Secretary of Defense (Health and Medical) by John E. Moore, OSD Director of Personnel.

For the past four years Dr. Cushing has served in important Government posts. He is a former member of the National Research Council and has held faculty appointments at Western Reserve and George Washington Universities.

When Dr. Cushing assumed his new duties, Colonel Sheldon S. Brownton, USAF (MC), formerly executive assistant to Dr. Berry, was elevated to director for planning and liaison in the Office of the Assistant Secretary of Defense (Health and Medical).

PROGRAM OF A. M. A. MILITARY MEDICINE SECTION, 7-9 JUNE

Scientific subjects of primary military importance but of interest to civilian physicians as well are scheduled for discussion by both civilian and military medical authorities at the annual meeting of the American Medical Association in Atlantic City, 6-10 June. The subjects to be presented at the Section on Military Medicine include handicaps and motivation, automobile accidents, effects of fallout radiation, the effect on the public of breaking the sound barrier, use of whole blood in military and civil defense emergency, psychological reactions in mass casualties, and modern concepts in the treatment of burns.

The chairman of this section is Major General I. S. Ravdin, member of the Civilian Health and Medical Advisory Council to the Assistant Secretary of Defense (Health and Medical) and John Rhea Barton Professor of Surgery, University of Pennsylvania. Colonel Charles L. Leedham, MC, USA is concluding his second year as secretary.

Meetings of the section will be held on the afternoons of 7, 8, and 9 June. Point credits for retention and retirement may be earned by all eligible reserve Medical Corps officers of the Army, Navy, and Air Force on inactive duty who attend the sessions.

Following is a complete program of the presentations to be made before the section:

Tuesday, 7 June

The Civilian Doctor and Our Future Security—Maj. Gen. Isidor S. Ravdin, MC, USAR (Ret.), University of Pennsylvania, Philadelphia, Pa.

Uremia-like Symptoms, Not Due to Uremia, in Battle Casualties—Maj. William H. Meroney, MC, USA, Army Medical Service Graduate School, Washington, D. C.

Acute Coronary Insufficiency. Application to Military Medicine—Arthur M. Master, M. D., Columbia University; Harry L. Jaffe, M. D.; and Leonard E. Field, M. D., New York, N. Y.

Handicaps, Motivation, and the Performance of Duty—Col. Lucio E. Gatto, USAF (MC), Sampson Air Force Base, N. Y.

Acute Infectious Hepatitis in the Armed Forces: The Advantages of Ad Lib Bed Rest and Early Reconditioning—Capt. Thomas C. Chalmers, MC, USAR, Army Medical Service Graduate School, Washington, D. C.; William

E. Reynolds, M. D., Charles S. Davidson, M. D., Boston, Mass.; Lt. Comdr. Richard D. Eckhardt (MC) USNR, U. S. Naval Hospital, Portsmouth, Va.; Joaquin G. Cigerroa, M. D., Laredo, Tex.; Norman Deane, M. D., New York; Robert W. Reifenstein, M. D., Syracuse, N. Y.; and Clifford W. Smith, M. D., Hines, Ill.

Peptic Ulcer: A Major Problem in Military Medicine—John H. Willard, M. D., University of Pennsylvania Graduate School of Medicine, Philadelphia, Pa.

Wednesday, 8 June

Crash and Live: Need Cars Kill More Soldiers Than Guns?—Col. Don S. Wenger, USAF (MC), Office of the Surgeon General, Department of the Air Force, Washington, D. C.

Response of Human Beings Accidentally Exposed to Significant Fallout Radiation—Comdr. Robert A. Conard, Jr. (MC) USN, National Naval Medical Center, and Lt. N. Raphael Shulman (MC) USN, Naval Medical Research Institute, Bethesda, Md.; Comdr. Eugene P. Cronkite (MC) USNR and Lt. Victor P. Bond (MC) USNR, Brookhaven National Laboratory, Long Island, N. Y.; and Lt. Richard S. Farr (MC) USNR, Chicago, Ill.

The Care and Evacuation of Vietnamese Refugees—Comdr. Julius M. Amberson (MC) USN, National Naval Medical School, Bethesda, Md.

Breaking the Sound Barrier and Its Effect on the Public—Col. John M. Talbot, USAF (MC), Air Research and Development Command, Baltimore, Md.

Report of the Office of the Assistant Secretary of Defense—Frank B. Berry, M. D., Assistant Secretary of Defense (Health and Medical), Washington, D. C.

Thursday, 9 June

Concepts of the Provision and Use of Whole Blood in Military and Civilian Defense Emergency—Lt. Col. William H. Crosby, Jr., MC, USA, and Lt. Col. Joseph H. Akeroyd, MSC, USAR, Army Medical Service Graduate School, Washington, D. C.

Management of Injuries to the Thorax—Brian Blades, M. D., George Washington University School of Medicine, Washington, D. C.

Psychological Reactions in Mass Casualties—Capt. Elmer L. Caveny (MC) USN (Ret.), Medical College of Alabama, Birmingham, Ala.

The Primary Care of Injuries About the Face—Truman G. Blocker, Jr., M. D., University of Texas School of Medicine, Galveston, Tex.

Principles of Management of Open Fractures—Oscar Hampton, Jr., M. D., Washington University School of Medicine, St. Louis, Mo.

Modern Concepts in the Treatment of Burns—Lt. Col. Curtis P. Artz, MC, USA, Brooke Army Medical Center, Fort Sam Houston, Tex.

ERRATUM

Due to a typographic error, Commander Thomas D. Gilson (DC) USNR was listed as (MC) in the March 1955 issue, page 346, of this *Journal.*

PROMOTIONS OF OFFICERS

The following officers of the military medical services on active duty in the Army, Navy, and Air Force have recently received temporary promotions to the rank indicated:

Medical Corps

Leon H. Alexander, *Lt. Comdr., USN*
Sydenha B. Alexander, *Lt. Comdr., USN*
Harry C. Alfred, *Maj., USAF*
Richard C. Ames, *Lt. Comdr., USN*
Harold C. Anderson, *Lt. Comdr., USN*
Frederick P. Asbury, *Lt. Comdr., USN*
Bruce F. Baisnh, *Lt. Comdr., USN*
Edgar P. Bang, *Lt. Comdr., USA*
Ira M. Barash, *Capt., USAF*
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Adolphus W. Dunn, *Lt. Comdr., USN*
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Ervin Ellison, *Lt. Comdr., USN*
John G. Esswein, *Lt. Comdr., USN*
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Margery E. Betzold, *Capt., USAF*
Ruth A. Browne, *Lt. Comdr., USN*
Mary A. Chanberlin, *Capt., USAF*
Diana M. Cica, *Capt., USAF*
Mary M. Clarke, *Capt., USAF*
Audrey B. Cochran, *Capt., USAF*
Margaret J. Cole, *Capt., USAF*
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Genevieve W. Combs, *Capt., USAF*
Charlotte R. Fatowe, *Capt., USAF*
Miriam E. Fellman, *1st Lt., USAF*
Delia E. Flaherty, *Capt., USAF*
Ethel L. Ginn, *Capt., USAF*
Eleanor F. Gravell, *Capt., USAF*
Jannette Greydanus, *Capt., USAF*
Mary J. Griffin, *Capt., USAF*
Sylvia R. Haller, *1st Lt., USAF*
Audrey E. Hanse, *Capt., USAF*
Elizabeth M. Herness, *Capt., USAF*
Marian B. James, *Capt., USAF*
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Irene J. Karaska, *Capt., USAF*
Berl G. Kline, *Capt., USAF*
Marriane R. Klose, *Capt., USAF*
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Vera M. Longbottom, *Capt., USAF*
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Marjorie E. White, *Capt., USAF*
Mary E. Williams, *1st Lt., USAF*
Doris G. Winters, *Capt., USAF*
Wanda M. Wollert, *Capt., USAF*

Women's Medical Specialist Corps

Marilyn J. Anderson, *Capt., USA*
Ida J. Cousins, *1st Lt., USAF*
Betty Lou E. Johnson, *Capt., USAF*
Harriet S. Lee, *Col., USA*
Ernestine Neuhardt, *1st Lt., USAF*
Agnes P. Snyder, *Lt. Col., USA*

NEW N. R. C. ARMY EDUCATION COMMITTEE VISITS SAN ANTONIO ON FIRST FIELD TRIP

On its first field trip, the new Army Medical Education Committee of the National Research Council recently inspected the training facilities of the Brooke Army Medical Center in San Antonio, Tex. This month the group will visit William Beaumont and Fitzsimons Army Hospitals.

Lieutenant Colonel H. Haskell Ziperman, MC, USA, demonstrates equipment used in a mobile Army surgical hospital to (from left): Dr. Grant Taylor, Dean and Professor of Pediatrics, University of Texas Postgraduate School of Medicine; Dr. Dean A. Clark, Superintendent, Massachusetts General Hospital; Dr. Joseph M. Hayman, Dean and Professor of Medicine, Tufts College Medical School; Dr. Franklin C. McLean, Professor Emeritus of Physiology, University of Chicago; Dr. Gaylord W. Anderson, Director and Mayo Professor, University of Minnesota School of Public Health; Dr. Thomas Bradley, staff member, National Academy of Sciences; Dr. Phillip Owen, Secretary, Division of Medicine, National Research Council; and Dr. Horatio Rogers, Assistant in Surgery, Harvard Medical School.

The committee of well-known medical educators replaces the former Advisory Committee of the Army Medical Service Graduate School. Instead of being limited to the scope of operations of the school, it will deal with professional education and training problems of the Army Medical Service in its entirety and will act in an advisory capacity to the Surgeon General.

Dr. Dean A. Clark, Boston, is chairman of the committee and Dr. Thomas Bradley, Washington, D. C., is executive secretary.

A MESSAGE FROM THE A. M. A.

The Commission on Organization of the Executive Branch of the Government (Hoover Commission), in one of its recent reports to the Congress, said that Federal medical services cost $4,149,000,000 in 1954 including over $2 billion in disability allowances—and a great deal of waste which could be prevented. In case this is not readily comprehended, the studies show that today the Federal government has undertaken specific responsibility for all or part of the medical care of 30 million people; roughly about one out of every five persons in the United States. The Commission's studies indicate that little fundamental improvement in Federal medical services has been made since March 1949 when it conducted a similar study and made a report to the Congress.

It is not surprising to learn that three government agencies —the Veterans Administration, the Department of Defense, and the Department of Health, Education, and Welfare—together account for over 90 percent of the total Federal expenditures for health activities or that the Veterans Administration alone accounts for over 60 percent of these total costs. Nevertheless, the report points out that by restricting medical services and disability payments to those veterans properly entitled to them, the government could save $330 million a year.

Since 1949, the number of civilian veterans has been increasing at the rate of almost one million per year. They now number 21 million. Therein lies the politics which anathematize a realistic and practical solution to that part of the problem.

A careful analysis of this report clearly reveals that two segments of our population have been given undivided and abundant medical service to such an extent that it is aptly referred to in the report as "chaos" and "huge wastes." What has been and is being done about national survival for the rest of our population? What does the report say about the medical aspects of civil defense preparedness?

Unfortunately, this 76-page report devotes only 17 lines to health planning for total war. The present status of medical planning for civil defense is described in the first two sentences of that portion of the report which says, "Our task force is particularly disturbed by the absence of a complete medical plan for

From the Council on National Defense of the American Medical Association. The views and opinions expressed are not necessarily those of the Department of Defense. —*Editor.*

survival in the event of atomic war. While long-range plans have been discussed, responsibility for integrated direction and control of all available medical resources has not been determined."

We can neither ignore the problem nor lessen the responsibility simply because no panacean plan is possible. Certainly in any feasible plan consideration must be given to the inevitable loss of lives and properties. However, the extent of such losses will be measured, to a large degree, by the adequacy of our civil defense preparedness. An A- or H-bomb attack, if not properly planned for, could cost us millions in casualties with widespread devastation to our vital industries.

A complete medical plan is an inescapable requirement for this nation's survival in an atomic age. Our nation does not have such a plan at this time, nor is it possible to formulate one without some drastic revisions in national policies and organization.

Before any effective medical care program can evolve, a clear-cut national policy must be established, widely publicized, and properly implemented. Only the Federal government has the technical resources and financial ability to provide the required leadership and co-ordination necessary for such a program.

With our national survival at stake, with a serious shortage of trained professional and technical personnel and facilities to cope with mass casualties, is it not imperative that the Federal government conserve medical manpower and resources whenever and wherever waste is demonstrated? The failure of the Federal government to take forceful and aggressive action to prepare this country medically and otherwise for devastation and destruction of atomic warfare is an open invitation to national annihilation.

Our article for the June issue of the *Journal* will cover such parts of the report as they pertain to the military services.

TREATMENT OF NERVE GAS CASUALTIES

The U. S. Army Chemical Corps Medical Laboratories has available for distribution a brochure describing the first aid and treatment of severe nerve gas casualties. The brochure provides a concise description of the signs and symptoms of anticholinesterase poisoning and outlines the basic principles guiding the management of such cases. Requests should be addressed to: Technical Information Office, Chemical Corps Medical Laboratories, Army Chemical Center, Maryland.

THE MEDICAL OFFICER WRITES

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DEATHS

DIMICK, George William, First Lieutenant, DC, USAR, Belle Fourche, S. D.; assigned to 4th Medical Dispensary, Darmstadt, Germany; graduated in 1952 from the University of Minnesota School of Dentistry; appointed a first lieutenant 14 June 1952; ordered to active duty 17 October 1954; died 17 March 1955, age 26, in Germany, of a gunshot wound..

HARDY, Charles Jackson, Second Lieutenant, MSC, USAR, Denver, Colo.; assigned to Cargo Helicopter Student Company, Camp Rucker, Ala.; attended Purdue University and the University of Colorado; appointed a second lieutenant 9 November 1953; ordered to active duty 23 May 1954; died 9 February 1955, age 24, near Newton, Ala., of injuries received in a helicopter accident.

LAGES, Charles Richard, Major, DC, USAR, Warson Woods, Mo.; assigned to U. S. Army Hospital, Fort Leonard Wood, Mo.; graduated in 1937 from the St. Louis University School of Dentistry, St. Louis, Mo.; appointed a major 18 May 1953; ordered to active duty 13 July 1953; died 23 February 1955, age 40, at Fort Leonard Wood, of injuries received in an automobile accident.

Reviews of Recent Books

SURGERY OF THE HEART, by *Charles P. Bailey,* M. D. 1,062 pages; 1,452 illustrations on 671 figures and 3 plates in color. Lea & Febiger, Philadelphia, Pa., 1955. Price $25.

This is the first publication that brings together under one cover a comprehensive and detailed study of surgery of the heart. The material presented is based largely upon the author's own experience in the field of cardiac surgery, an experience which in volume is probably unequaled in the world today. For this reason alone, the book immediately becomes an invaluable contribution to surgery. It is written primarily for surgeons, but internists, cardiologists, and pediatricians could greatly benefit by including it in their selective reading. Practicing physicians and undergraduates can find helpful information in regard to modern concepts of surgical treatment of heart disease.

The book begins with a brief but delightful resumé of the development of cardiac surgery, including transient visions of future developments in this field. There follow essentially three compartments: The first six chapters contain enlightening discussions of general interest, including anesthesia, hypothermia, exploratory cardiotomy, the heart-lung machine, and cardiac resuscitation. The remainder of the book is divided into surgery of congenital heart disease and of acquired heart disease. On congenital heart disease, all well-established procedures are given, as well as some revolutionary methods of correction of the more complicated anomalies. Some of these are yet in developmental stages and are obviously subject to acute, critical analysis in the light of future experience. Particular reference is made to the ingenious but complicated two-stage method for correction of transposition of the great vessels. The section on surgery of the mitral valve is the most complete available and is highly recommended for those whose experience is minimal.

All topics are attended by considerable interesting historical background, and the author draws heavily and accurately from medical literature. The bibliography is extensive, and valuable as a source of reference material. The index is brief, and is inadequate for location of other than major topics of interest. This book is highly recommended as a reference for those in any way interested in cardiac surgery.

—*LUTHER G. BELL, Capt. (MC) USN*

BIOCHEMICAL DETERMINANTS OF MICROBIAL DISEASES, by *René J. Dubos.* 152 pages. Harvard University Press, Cambridge, Mass., 1954. Price $3.50.

This book is a welcome addition to the list of Harvard University monographs in medicine and public health. It is composed of a series

of essays dealing with the biochemical factors which influence the ability of microbial agents to proliferate and to cause disease. The author points out that although infection is commonplace, only a small percentage of infected individuals develop symptoms or pathological lesions. His essays delve into the reasons for this, with emphasis on the properties of the infected host that determine the course and outcome of the infection.

The effects of tissues, body fluids, phagocytes, and their biochemical constituents on micro-organisms in vivo are considered. In addition, the toxic effects of infections, including the Shwartzman phenomena and the Arthus reaction, are analyzed. There is an interesting analysis of the type of immunity which exists in the absence of detectable protective antibodies.

The material has been gathered from a large number of sources and is organized superbly. The book is well written and stimulating to read. There are numerous tables illustrating the effects of various substances on growth and toxicity of micro-organisms, and a complete biography. The format is excellent and adds considerably to the volume's readability.—*EUGENE V. JOBE, Capt. (MC) USN*

RENAL FUNCTION, edited by *Stanley E. Bradley*, M. D. 218 pages; illustrated. Sponsored by Josiah Macy, Jr. Foundation, New York, N. Y., 1954. Printed by Corlies, Macy & Co., Inc., New York, N. Y. Price $3.75.

This book, which presents the transactions of a conference, is organized into sections on the nephrotic syndrome, kidney transplantation, and acute renal failure. A formal presentation on each topic furnishes a point of departure for wide ranging and lively discussion by the other experts present. Informality is well preserved "so that the reader may participate vicariously in the give and take." In the process also preserved are some ambiguities and non sequiturs.

The book begins with a discussion of the sodium-retaining adrenal corticoid found in the urine of patients with nephrotic syndrome or other edema states. The nature and definition of "nephrosis," its relation (if any) to glomerulonephritis, the relation of glomerular filtration rate to sodium excretion, and the validity of creatinine and inulin clearances in disease are briefly discussed, followed by a summary of experience on treatment of the nephrotic syndrome with ACTH and adrenal steroids.

Because meager literature is available on kidney transplantation in man, the second section is especially valuable in presenting an interesting preliminary report on the operation in 10 patients. Although the results in none of these were finally successful, the responses in two patients give encouragement to continued study. One achieved an unusual degree of function, though transient, and the other an exceptional survival (five and one-half months) of the transplanted kidney.

The last section concerns renal pathophysiology in acute tubular necrosis. The composition of the urine is said to suggest that there is an "osmotic diuresis per nephron," though proof appears impossible. The "replacement" of sodium chloride and water during the diuretic phase is a controversial subject, evoking much speculation about mechanisms of the regulation of body volume, composition, and osmotic pressure. Other subjects mentioned include the role of infection in the disease, the use of hemodialysis, and experiences with various dietary and intravenous feeding regimens in treatment.

This book should appeal particularly to the clinical investigator interested in renal, and fluid and electrolyte physiology.

—*MARION E. McDOWELL, Maj., MC, USA*

THE CONCEPT OF SCHIZOPHRENIA, by *W. F. McAuley*, M. D. 145 pages. Philosophical Library, New York, N. Y., 1954. Price $3.75.

This book, by its small size and restriction to a single entity, appeals to student, teacher, and busy practitioner. One is quickly impressed by its readability, clarity, and conciseness.

A brief recital of the concept of mental illness held by ancient philosophers is followed by a survey of Kraeplin's observations which led him to conceive of dementia praecox as an entity. Significant contributions of many workers in psychiatry and related fields are presented sequentially, so that the concept of schizophrenia comes into clearer focus, yet at the same time has its boundaries extended. Current thought relative to the role of heredity and environment, neurophysiology and metabolism, and early diagnosis and treatment are included.

In no other single source has the reviewer found the gamut of significant contributions on the subject winnowed, abstracted, and presented so smoothly, objectively, and interestingly.

EATON W. BENNETT, Col., MC, USA

TREPONEMATOSES, by *T. Guthe*, M. D., and *R. R. Willcox*, M. D. 79 pages; 27 illustrations. World Health Organization, Palais Des Nations, Geneva, Switzerland, publisher, 1954. Columbia University Press, New York, N. Y., Distributor. Price $0.50.

This publication is a reprint of a special 1954 number of the *Chronicle* of the World Health Organization. The authors discuss the changing concepts in the epidemiology and control of the treponematoses: syphilis, yaws, pinta, and bejel. Emphasis is placed on nonvenereal syphilis in children and young adults in regions of Europe, the Middle East, and Africa. This type of endemic syphilis is considered an important problem; its incidence depends on return to conditions of poverty, overcrowding, war, or a combination of factors.

The symptomatology and serologic relationships of the four treponematoses are excellently summarized. Mass use of penicillin is discussed and the importance of repository preparations is emphasized.

The progress of antitreponematoses campaigns of the WHO and UNICEF in various parts of the world is concisely reviewed. Emphasis is placed on international co-ordination of research, particularly in regard to standardization of serologic reagents and methods.

This paper-bound publication has a detailed table of contents, is well illustrated with maps, tables, graphs, and photographs, and the documentation is adequate. At the end of the publication is a good bibliography on treponematoses control, although all of the references in this section are from publications of the WHO or affiliated agencies.

This publication is of general interest, but of particular value to public health workers and those engaged in treponematoses problems in the field and laboratory.—*PAUL A. KEENEY, Col., MC, USA*

SHOCK AND CIRCULATORY HOMEOSTASIS, edited by *Harold D. Green,* M. D. 230 pages; illustrated. Josiah Macy, Jr. Foundation, New York, N. Y., 1954. Price $3.50.

This book is a report on the Third Conference on Shock and Circulatory Homeostasis, and is divided into three separate topics. The first part covering experiences with shock in the Korean conflict was presented by Dr. John Howard and concerns the problems encountered in the management of shock in severely wounded patients at a forward hospital. The discussion that follows gives real insight into the problems of shock following injury. The second part on reflex factors in the regulation of the circulation was presented by Dr. G. S. Dawes. In the discussion, present day thinking of an important phase of the physiology of the circulatory system is outlined. The last part covers functional properties of blood vessels, presented by Dr. Robert Alexander. The queries by various members of the Conference bring out the concepts of the mechanical properties of the vascular bed.

The book is well indexed and contains excellent references at the end of each section. It is recommended for physicians interested in physiology and persons carrying out investigative studies in the field of circulatory dynamics. It is fascinating reading, revealing the concepts of various experienced research workers who freely discuss the topics involved.—*CURTIS P. ARTZ, Lt. Col., MC, USA*

TEXTBOOK OF PEDIATRICS, edited by *Waldo E. Nelson,* M. D. 6th edition. 1,581 pages; illustrated. W. B. Saunders Co., Philadelphia, Pa., 1954.

This book is a continuation of the Griffith-Mitchell, and Mitchell-Nelson series of textbooks of pediatrics. The sixth edition now rightfully becomes Nelson's *Textbook of Pediatrics.*

The editor's first desire was to make the text as representative of current pediatric thought and practice as possible. To accomplish this, many sections have been completely rewritten and many others, largely so; also, several new ones have been added. With the collaboration of

70 contributors, the editor has been eminently successful in making this text up to date. It will certainly retain its place as a standard pediatric reference in the English-speaking countries.

This edition, although slightly shorter than the last, contains many added practical features, such as completely revised chapters on drug therapy, tumors and neoplasms, preventive pediatrics, and the administration of parenteral fluids. One would be hard put to find any aspect of pediatrics in its broadest sense not satisfactorily covered. The style, although the product of many contributors, is with very few exceptions extremely lucid. There are more than 400 helpful illustrations, 20 of which are in color. The typography and format are of the highest order.

This book is enthusiastically recommended to anyone interested in the medical care of children. In my opinion, an effective and practical answer to almost any pediatric problem that might face the medical student or practitioner will be found in this textbook.

—THOMAS E. CONE., Jr., Comdr. (MC) USN

THE MICROPHYSICAL WORLD, by *William Wilson,* Ph. D., D. Sc. 216 pages; illustrated. Philosophical Library, Inc., New York, N. Y., 1954. Price $3.75.

This very readable, small volume on the general topic of the physical sciences is written especially for the layman. It is not considered suitable for reference material because numerous topics are discussed too briefly for rigorous, complete treatment of data although sufficiently to give the reader an understanding of the relationship among a variety of topics, such as spectra and spectroscopy, x-rays, radioactivity, and many similar subjects relating to atoms and molecules. Considerable attention is given to historical development of certain phases of the topics as well as modern theory.

The book is of convenient coat-pocket size consisting of 13 chapters, a short bibliography, and an adequate index. It contains comparatively few illustrations and graphs, and no actual photographs. The equations used to develop a final equation are well described.

—ROY D. MAXWELL, Col., MSC, USA

THE THEMATIC APPERCEPTION TEST AND THE CHILDREN'S APPERCEPTION TEST IN CLINICAL USE, by *Leopold Bellak,* M. D. 282 pages; illustrated. Grune & Stratton, Inc., New York, N. Y., 1954. Price $6.75.

In the author's words "this book is meant primarily to be of practical use to the student and practitioner of clinical psychology and psychiatry." While it offers many specific suggestions for improving the use of the thematic apperception test (TAT) it does not present a detailed scoring system. The approach is that of presenting a theoretical framework which will assist the clinician in making analytically meaningful interpretations of TAT responses. About half of the book is devoted to the children's apperception test.

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In a theoretical chapter the author discusses the ego psychologic theory of projective technics, the apperceptive distortion theory concerning content of responses, and the basic assumptions for diagnostic inferences from the TAT. Several chapters concern the use of the TAT, including a brief discussion of 20 different methods of scoring and several case illustrations, and its application in psychotherapy.

The children's apperception test (CAT) is a direct descendant of TAT and is designed for use with children from three to 10 years old. Animals rather than persons are used in the stimulus pictures. The CAT supplement (CAT-S) was designed to supply pictures for use in special situations. The theoretical framework presented for the TAT is considered to be basically valid for the CAT and the CAT-S. The analysis and interpretation of the CAT is considered in detail with a tabulation scheme presented for each separate card.

This book, which is based on extensive clinical and academic experience, is recommended to all users of projective tests. It is readable and the material is organized for ready reference. Technical terms and concepts are defined as introduced.

—ANTHONY C. TUCKER, Col., MSC, USA

THEORY AND PRACTICE OF CROWN AND BRIDGE PROSTHESIS, by *Stanley D. Tylman,* D. D. S., M. S. 3d edition. 1,017 pages; 1,364 text illustrations and 9 color plates. The C. V. Mosby Co., St. Louis, Mo., 1954. Price $16.

This new edition of a well-known text and reference work contains six chapters and some 200 pages not found in previous volumes. It is profusely illustrated and contains excellent reference listings at the close of each chapter.

The new material includes a discussion of the indirect technic in crown and bridge construction with emphasis on the use of newer dental materials peculiar to this technic, recent progress in the use of cutting instruments, and evaluation of newer methods of pulp protection both during and after operative procedures.

Several chapters are devoted to a discussion of the physical properties and the technics of using acrylic resins in crown and bridge prosthesis. The closing chapter entitled, "Oral Rehabilitation," contains a well-presented discussion of the factors to be considered when approaching a case of "bite opening." A thorough study of all anatomic features associated with such procedures is advised, and several methods of obtaining data on rest positions of the mandible are outlined.

Biomechanical considerations are stressed throughout the text, a feature this reader believes cannot be overemphasized in a work so widely used in the teaching of this complex subject.

—DONALD C. HUDSON, Col., USAF (DC)

PSYCHOANALYTIC INTERPRETATION IN RORSCHACH TESTING, by *Roy Schafer*, Ph. D. 446 pages. Grune & Stratton, Inc., New York, N. Y., 1954. Price $8.75.

This book is for the experienced Rorschach tester who possesses an understanding of general analytic theory, but the discussion of the nature of the Rorschach response process and the dynamics of the test situation makes it recommended reading for less sophisticated workers. It is divisible into four major parts: (1) a consideration of the dynamics of the test situation, with emphasis on the tester-patient relationship; (2) the Rorschach response process as representative of various aspects of the dream-simple perception continuum; (3) a consideration of content or thematic analysis along with cautions and safeguards to be observed in such interpretations; (4) a detailed study of actual Rorschach test responses against the framework of four main mechanisms of defense: repression, denial, projection, and the obsessive-compulsive syndrome.

The original insight displayed by the author recommends the book as indispensable to the Rorschach worker. His rigorous, objective, and scientific attitude while attempting to advance extremely complex theoretic speculations is most commendable and his introductory emphasis on cautious thematic interpretation should please the most conservative psychologist. If he slights formal analysis, and overemphasizes the importance of a psychoanalytic point of view, this is understandable because he is attempting to present a particular methodology. However, when he uses some interpretations of an obviously naive, unskilled, and inexperienced tester and implies that these represent the eclectic position, and then proceeds to belabor the eclectic psychologist with this as his rationale, one wonders what has become of the detached scientist.

But if these are serious flaws in an otherwise stimulating and thoughtful publication, the final value of this sensitive, complex, and creative presentation is worth many times the price of the volume. It is easily one of the 10 best books written on the subject of Rorschach testing. —*WALTER J. GLEASON, First Lt., MSC, USA*

ESSENTIALS OF PEDIATRICS, by *Philip C. Jeans*, M. D.; *F. Howell Wright*, M. D.; and *Florence G. Blake*, R. N., M. A. 5th edition. 808 pages; 103 illustrations, including 3 color plates. J. B. Lippincott Co., Philadelphia, Pa., 1954. Price $4.75.

This book has been one of the standard texts used in the instruction of student nurses for many years. It is well planned, and the style is simple, readable, and stimulating. The first section, on "Orientation," includes an introduction to pediatric nursing and touches on preventive pediatrics. This is followed by "Growth, Development, Care, and Guidance of the Infant and Child." The other unit headings are "General Nursing Care," "Nursing in the Care of the Sick Infant and Child," and

"Nutrition and Nutritional Diseases." These provide a comprehensive coverage of all aspects of pediatric nursing. An especially valuable teaching feature is the group of questions or, as the authors term them, "Situations for Future Study" at the end of each subdivision.

The brief discussions on diagnosis and treatment, which accompany the descriptions of the various diseases, are especially gratifying to a physician. They are informative enough so that a nurse can intelligently follow, understand, and appreciate the reasons for a doctor's orders, but at the same time they will not lead her into the "perils of half-knowledge" or make her into the "nurse learned" that Osler so deplored in his essay, "Nurse and Patient."

The index is complete, the bibliographies are adequate, and the illustrations are of good quality. This book is highly recommended for student nurses and nurses who are taking postgraduate courses in pediatrics. The fact that in the past 20 years it has passed through five editions in itself shows the place the book has earned in the field of pediatric nursing instruction.—*JOHN F. SHAUL, Comdr. (MC) USN*

A HISTORY OF MEDICINE, in Two Volumes, by *Ralph H. Major,* M. D. 1,155 pages; illustrated. Charles C Thomas, Publisher, Springfield, Ill., 1954. Price $14.50 set.

Five English-language histories of medicine (either new or in new editions) have appeared during the last decade, and now we have a sixth. In his preface, the author tells us that he has attempted "to write a continuous account of the stream of medical history, punctuated with the names of eminent physicians," and that the work is written "primarily for the medical student and the medical practitioner, in an attempt to interest them in the history of their own profession." The book begins with primitive medicine, proceeds through the history of Greece, Rome, the Middle Ages, and the Renaissance, and then by centuries down to the present time, with a separate excursion into American medicine of the early nineteenth century. Following each chapter is a section of "biographical addenda" which gives brief sketches of men not mentioned in the narrative portion of the work, or which gives additional data on those who are mentioned. These addenda are generally arranged chronologically, by date of birth.

Unfortunately, this book can best be described as a rather inconveniently arranged medical biographic dictionary. Over 2,000 famous physicians are mentioned in half that many pages. Of one man we are told that he wrote a treatise on hellebore and was an advocate of cold baths; of another, that he was a quarrelsome person and in constant strife with the College of Physicians. We learn, for example, that Benjamin Waterhouse (1754-1846) carried on a crusade for vaccination that resulted in his impoverishment, resignation from a professorship at Harvard, and the loss of much medical practice, but that James

Jackson (1777-1867), on the other hand, who succeeded Waterhouse at Harvard in 1812, and who was also a crusader for vaccination, was a conspicuously successful physician; if there is anything else involved here besides the fact that Jackson was born 20 years after Waterhouse and died 20 years after him to account for their varying degrees of success, we are left to speculate as to what the factor may be.

The author reminds us that the good physician, throughout the ages, has felt "the urge to impart his knowledge to other members of his profession and the desire to record the lives and deeds of outstanding physicians." But history involves more than recall; it involves an attempt to recreate the past, to place ideas in their proper settings, to show the development of those ideas as well as to chronicle the fleeting figures who pass across the scene; the historical sense, as Lionel Trilling says, is to be understood as the critical sense. What Dr. Major has produced is not a history, but an act of reverence, for which he merits our respect, if not our acclaim.

—FRANK B. ROGERS, Lt. Col., MC, USA

THE YEAR BOOK OF GENERAL SURGERY (1954-1955 Year Book Series), edited by *Evarts A. Graham*, M. D. 500 pages; illustrated. The Year Book Publishers, Inc., Chicago, Ill., 1954. Price $6.

This book is a representative review of general surgical literature. The majority of articles reviewed and abstracted are of domestic origin; however, an effort has been made to include the available surgical literature of all countries whose journals were obtainable. This volume is similar to and compares favorably with previous and companion volumes. The abstracts are conveniently arranged according to subspecialties or anatomic areas, such as cardiac surgery, the abdomen, biliary tract, pancreas, esophagus, and genitourinary system, in 33 subsections. A section on anesthesia edited by Stuart C. Cullen, M. D., is added. The volume contains two indexes, one for subject material and one for authors.

The author has done well in preparing and compiling abstracts of the best and most representative papers in recent surgical literature. The volume is suitable for use as a quick and ready reference as a guide to determine the trend in recent surgical publications. The reviewer recommends that it be used in this manner rather than as a substitute for more complete study and reading. The material abstracted is of necessity brief and often misleading to those who have not completely reviewed the literature. For example, on page 372, where the reviewer is reporting the technic for treatment of hiatal hernia of the diaphragm, there is a statement that sutures should be passed through all layers of the "esophagus." Reference to the original article reveals that the author states that sutures should be passed through all layers of the "diaphragm." To one who is experienced in performing this type

of operative procedure, the typographical error is obvious, but perhaps not to the inexperienced or one who has not studied the subject completely.

Dr. Graham is to be congratulated for accomplishing a gigantic and important task of abstracting and compiling pertinent surgical literature in such a complete, convenient, and well-organized manner. His excellent literary style, illustrations, organization, and indexes add to its value. This book should be available to all surgeons, and especially to all physicians who need a quick and ready reference to representative abstracts of articles from the surgical literature of the year.

—ROBERT T. GANTS, Col., MC, USA

ESSENTIALS OF REMOVABLE PARTIAL DENTURE PROSTHESIS, by *Oliver C. Applegate,* D. D. S., D. D. Sc., F. A. C. D. 323 pages; 352 illustrations, with 10 in color. W. B. Saunders Co., Philadelphia, Pa., 1954.

The author has satisfied one of dentistry's pressing needs by presenting a text which sets forth sound, modern concepts in the field of partial denture prosthodontics. Commendable simplicity is obtained through a direct question and answer style, and through the generous distribution of carefully selected illustrations. The complete table of contents, an abundance of cross references, and well-organized index make for easy use of the book.

Oral examination, office and laboratory procedures, denture maintenance, and patient education are capably considered. The general pattern followed throughout is to emphasize fundamentals first, and then apply the pertinent factors to situations encountered in practice. Kennedy's classification of partially edentulous mouths is used advantageously to place any restoration problem in one of four basic groups. An understanding of characteristic designs that satisfy the requirements of each group is facilitated to make possible the mastery of denture planning. Modification of the primary designs to meet individual needs is discussed. Unfortunately, numerous editorial errors mar an otherwise skillfully prepared text.

—ARTHUR R. FRECHETTE, Capt. (DC) USN

MEREDITH'S HYGIENE, by *Arthur F. Davis,* Dr. P. H., and *Warren H. Southworth,* Dr. P. H. 5th edition. 906 pages; illustrated. The Blakiston Co., Inc., New York, N. Y., 1954. Price $6.

The fourth edition of this comprehensive and excellent textbook for college students has been extensively rewritten and brought up to date although the basic organization of the previous edition has been maintained. The authors have drawn widely from official and voluntary health agencies for latest statistical data and health information. The greater portion of the volume is given to the part entitled "The Hygiene of Everyday Life," which concerns physiology and personal hygiene. The medical information presented throughout the book is sound. The

material in the five chapters in the section on mental health is very clearly presented and should be easily understood by the average college student. Throughout the work the responsibility of the individual for protecting and promoting his own health as well as the health of others is stressed.

The material is well organized, presented in a concise manner, and should be of interest to all concerned with health education. There is an excellent biography of recent reference material and a comprehensive list of educational motion picture films with descriptive information and sources of procurement. This appears to be the type of book a college student would wish to keep for future reference; in addition, it is recommended for physicians concerned with community public health, nurses, and educators.—*GEORGE R. CARPENTER, Col., MC, USA*

EMERGENCY TREATMENT AND MANAGEMENT, by *Thomas Flint, Jr.*, M. D. 303 pages. W. B. Saunders Co., Philadelphia, Pa., 1954.

In this book the author has collected and organized information on the recognition and treatment in both medical and surgical emergencies at the level of the "emergency physician." The material has been arranged partly in outline form, listing the prominent symptoms and physical findings in many conditions which may require urgent or immediate treatment. The conditions are listed in alphabetic order under diagnostic titles, which detracts from the value of the book as a ready reference for aid in the differential diagnosis of apparent emergency situations. A large portion of the book is devoted to chemical poisons in the alphabetic P section. The last section deals with administrative, clerical, and medicolegal principles, including Blue Cross coverage, emergency records, treatment permits, legal responsibility, and reportable diseases defined by most state health departments.

It appears that the book will appeal principally to physicians engaged in industrial medicine, but will have limited appeal to those in private or hospital practice.—*EDWARD C. KENNEY, Capt. (MC) USN*

SURGICAL TREATMENT OF CANCER OF THE CERVIX, edited by *Joe V. Meigs*, M. D. 462 pages; illustrated. Grune & Stratton, Inc., New York, N. Y., 1954. Price $12.

This excellent volume, edited by an authority on the subject, presents all the known methods of surgical approach in the treatment of cancer of the cervix. It will serve as a valuable text for all who are interested in treatment of cervical cancer.

The views of the editor, based on 35 years of experience with the disease, are expressed in a highly informative and easily readable manner. The roles of surgery and radiation are discussed as to indication and relative merit. Emphasis is placed on the importance of chemotherapy and antibiotics, and the need for painstaking care of

the patient before, during, and after surgery. The prevention and management of complications that may occur in radical surgery on the female pelvis also are discussed.

This book consists of 13 chapters, three of which are devoted to an excellent description of the anatomy of the pelvis with illustrations and discussions of the importance of the lymph structures and blood vessels in radical surgery. The remaining 10 chapters contain brief but very interesting editorial comments by the editor and by his distinguished contributors on the various methods of surgical approach. These methods and technics are thoroughly discussed and beautifully illustrated. Included are surgical procedures for carcinoma-in-situ and for abdominal and vaginal radical hysterectomy. Total exenteration of the pelvic organs and the fulguration treatment of recurrent cancer of the cervix are discussed in detail.

I consider this book with its complete bibliography a masterful treatise on cancer of the cervix and recommend it as an essential addition to every medical library.

—*L. MARSHALL HARRIS, Capt. (MC) USN*

DISEASES OF WOMEN, by *Robert James Crossen,* M. D. 10th edition. 935 pages; with 990 illustrations including 41 in color. The C. V. Mosby Co., St. Louis, Mo., 1953. Price $18.50.

This gynecologic text has remained one of the standard references since 1907. The tenth edition incorporates many improvements over previous ones. The liberal use of colored diagrams and photographs, together with many black and white pictures, adds greatly to its attractiveness.

While many of the chapters remain essentially the same, there are several improvements. The chapter on anatomy and physiology incorporates the newer concepts of oogenesis and the development of the various ovarian structures. The section on endocrinology has been rewritten and brought up to date in the light of present knowledge. The psychosomatic aspects of gynecologic problems have been enlarged, with a detailed discussion of the physical and psychic changes occurring during the formative years of puberty and adolescence. Much new material has also been added on vaginal smears, pregnancy tests, culdoscopy, culdocentesis, and endocrine therapy. In this day of argument over surgery versus radiation therapy, the new section on radiation therapy is most timely.

As with previous editions, this book is, for the most part, clearly and concisely presented. It remains one of the standard textbooks in the field of gynecology, and is highly recommended for students, general practitioners, or specialists as a sound, conservative reference.

—*GEORGE C. CALDERWOOD, Comdr. (MC) USN*

THE NEUROANATOMICAL BASIS FOR CLINICAL NEUROLOGY, by *Talmage L. Peele*, M. D. 564 pages; illustrated. McGraw-Hill Book Co., Inc., New York, N. Y., 1954. Price $12.50.

It is increasingly necessary to include in neuroanatomic textbooks more detailed discussions of physiologic function in order to adequately correlate and integrate anatomic structure. This author has gone even further in writing a well-balanced text from the standpoint of neuroanatomy, neurophysiology, and clinical neurology. Each part of the nervous system is visualized in its functional integrity within the whole. The style is lucid and most pleasing, and each chapter is tersely but adequately summarized. Throughout the book, the more recent advances along neurologic experimental lines are presented in sufficient detail to allow for proper emphasis and to permit understanding on the part of the reader. The annotated data, both physiologic and anatomic, are meticulously presented. Function, normal and deranged, is emphasized from the outset and in more detail than in the usual neuroanatomic text. While some might criticize the details presented in the text and its length, particularly for use as an introductory text, nevertheless teaching experience in neuroanatomy has proved that there are all gradations of students, and the more advanced and more intelligent demand the answers to many questions which can only be conveniently furnished by sufficient detail, otherwise neuroanatomy becomes a memorized proposition.

The text is as up to date as is possible in this rapidly changing field. A certain number of experimental arguments and conflicting opinions are presented, challenging the student to make up his own mind. The illustrations have been selected from many sources and are among the very best and well pictorialize the written material. The split-page format is employed. Bold black type is used to emphasize key words which make for ready reference. There is a bibliography of 870 titles and the index is adequate.

The organization and plan of approach in this text is the best that has come to the attention of this reviewer. Possibly the text might best serve the advanced student or the exceptional beginner. It should be read by every serious student of neuroanatomy and by those practicing neurologists who desire to keep abreast of current functional and neuroanatomic developments. Further, it should prove an excellent review for the neurologist who is preparing for the American Board examinations in neurology and it is a must for those interested in or engaged in the field of neurology. The author is a competent teacher of neuroanatomy, as well as a clinician, and the material was favorably reviewed by competent authority prior to publication. There is little this reviewer can add, except the highest praise.

—*RICHARD R. CAMERON, Lt. Col., MC, USA*

TOOTH FORM DRAWING AND CARVING, by *Russell C. Wheeler,* D. D. S. 2d edition. 106 pages; illustrated. W. B. Saunders Co., Philadelphia, Pa., 1954.

For its intended use by the "dental ancillaries," this easy-to-read and understandable manual meets the author's objective and covers the subject matter adequately. For the associated groups, especially laboratory technicians, perhaps additional emphasis could have been placed on why tooth contours, grooves, ridges, and other anatomic features are so important to restore normal function. More discussion of the anomalies of crowns and roots found in natural dentition would prepare the ancillary groups more adequately for their part in the overall dental health picture. Establishing the concept of the third dimension by carving cannot be overemphasized for the dental student and associated groups. The emphasis placed on this in the manual is superb.

The organization, format, and illustrations are excellent. The style of the manual is easy to follow and understand, and it is an excellent text for the dental student and associated groups in the study of dental anatomy.—*FRANCIS E. CUMMINGS, Col., USAF (DC)*

RETROPUBIC PROSTATECTOMY, by *Francis A. Beneventi,* M. D. 44 Original Drawings by *William P. Didusch.* 227 pages. Charles C Thomas, Publisher, Springfield, Ill., 1954. Price $11.

This monograph reviews the development of retropubic prostatectomy and appraises the results of this latest addition to the urologist's approach to the prostate. The author recommends limiting the applicability of this operation to benign prostatic enlargement.

Following a description of the anatomy, embryology, and blood supply of the prostate, the author presents an excellent discussion on his subject, beautifully illustrated with color plates. His technic of the surgical procedure is described in great detail and graphically portrayed with 44 incomparable illustrations by William P. Didusch. He not only describes variations in technic but offers valid arguments for each. His eccentric bag catheter which may offer some advantages is unique.

Both the preoperative and postoperative management of patients as well as the evaluation of associated disease, fluid and electrolyte balance, care of the catheter, and treatment of complications are discussed in detail except that mention of postoperative bladder spasm for some reason is omitted. A complete chapter is devoted to osteitis pubis, the contention being that the condition is no more prevalent in this operation than in other prostatic surgical procedures.

Finally, the author thoroughly evaluates the results of his first 100 patients treated by this method. His mortality rate of seven percent seems unduly high, but the cases were unselected and 75 were service patients. A complete bibliography is appended to each chapter.

This book is a welcome addition to the urologist's library.

—*JACK W. SCHWARTZ, Col., MC, USA*

DONOVANOSIS, by *R. V. Rajam,* M. S., F. R. C. P., and *P. N. Rangiah,* M. D. World Health Organization Monograph Series No. 24. 72 pages; illustrated. Columbia University Press, New York, N. Y., Distributor, 1954. Price $1.50.

The disease discussed in this monograph is better known in this country as granuloma inguinale. The authors are associated with Madras Medical College in India, as was Major Charles Donovan who discovered and described the causative organism of the disease 48 years ago. This, no doubt, was a major factor in the selection of the name "Donovanosis," for which the authors make an excellent case.

Recommended particularly to students of venereal disease, the work is concise and complete in all respects, from the nomenclature and history of the disease through the pathology and treatment. The compiled information came from the authors' own work and from a total of 82 references, many of which are from the American literature. The organization of the material is excellent and logical, with a minimum of extraneous facts and discussion.

Donovanosis is a disease which is seen sporadically in military practice and is not uncommonly misdiagnosed. Since it is a chronic, progressive, destructive disease that may be incurable in advanced cases, some knowledge of it is essential to the military physician.

This monograph is recommended as the most complete and timely source of information on the disease that is available at this writing.

—*SYDNOR T. WITHERS, Lt. (MC) USN*

THE STATUS OF MULTIPLE SCLEROSIS. Editor, *Roy Waldo Miner.* Originally published in Annals of The New York Academy of Sciences, Volume 58, Art. 5, pages 541-720, July 28, 1954. Illustrated. The New York Academy of Sciences, New York, N. Y., 1954. Price $4.50.

This book is a compilation of papers presented at a conference on multiple sclerosis held by the Section of Biology of the New York Academy of Sciences and the National Multiple Sclerosis Society in April 1953.

The papers are all well presented and in some of them constructive criticism is included in the discussion. Although it is obvious that very little is known even now concerning this disease, this is an excellent attempt to bring together in one book, not only all of the current work in progress but also the present status of all methods of treatment. Although no treatment has yet been successful in halting the progress of the disease, various factors have prolonged the life of patients. These include an understanding of the basic metabolism of a patient, proper nursing care, and an appreciation of psychologic mechanisms. The use of drugs including histamine, ACTH, cortisone,

adenylic acid, and sodium succinate, is ably discussed, and their limited value is stressed.

This book will be of particular value to those practitioners who are faced with the problem of treating and following cases of multiple sclerosis, as well as to research workers in the field.

—HENRY S. COLONY, Comdr. (MC) USN

DOCTORS IN THE SKY: The Story of the Aero Medical Association, by *Robert J. Benford,* M. D., Colonel, Medical Corps, United States Air Force. 326 pages; illustrated. Charles C Thomas, Publisher, Springfield, Ill., 1955. Price $8.75.

Aviation medicine can be said to have reached maturity. An appreciation of this growth can best be achieved by a review of its origin, growth, and development so admirably revealed in this narrative-history: the story of the Aero Medical Association in its first 25 years.

The 12 chapters are replete with details which give the reader a deep appreciation of the early struggles and later accomplishments of aero-physicians. Among the interesting subjects covered are the growth of the specialty of aviation medicine, the role of the physician in air commerce, flight surgeons in military and civilian life, and the rise of aviation medicine journalism. Particularly effective are descriptions of the many prominent and pioneering individuals who have been intimately associated with the growth of aviation medicine in this country.

There is a valuable appendix including lists of past officers, honorary members and fellows, physicians certified in this specialty, leaders in the field, and a selected bibliography. There are more than 50 photographs, which add to the readability of this timely book. Notable also are the foreword by Dr. John F. Fulton of Yale, an index of names as well as subjects, and particularly a detailed account of the cardinal role of Dr. Louis H. Bauer in the creation and growth of aviation medicine.

The author, who is also editor of the *Journal of Aviation Medicine,* is to be commended on successfully accomplishing a difficult but important task. The vital role of aviation medicine can better be appreciated.

—DAN C. OGLE, Maj. Gen., USAF (MC)

ATTENTION, ALL AUTHORS

The checking and correcting of references, it may be said here and emphatically—one of the necessary drudgeries of documentation—is dreary, painstaking work. If editors were permitted only one tip to authors it might be that they should restrict the number of references appended to their papers to those that are important and that they should be correct.

— New England Journal of Medicine
p. 114, Jan. 20, 1955

New Books Received

Books received by the *U. S. Armed Forces Medical Journal* are acknowledged in this department. Those of greatest interest will be selected for review in a later issue.

THE HUMAN MACHINE, Biological Science for the Armed Services, by *Charles W. Shilling*, Captain, Medical Corps, United States Navy. 292 pages; illustrated. United States Naval Institute, Annapolis, Md., 1955. Price $5.

EARLY CARE OF ACUTE SOFT TISSUE INJURIES, Committee on Trauma. 192 pages. American College of Surgeons, Chicago, Ill., 1954.

SEGMENTAL ANATOMY OF THE LUNGS, A Study of the Patterns of the Segmental Bronchi and Related Pulmonary Vessels, by *Edward A. Boyden*, Ph. D. (Med. Sc.), Professor Emeritus of Anatomy, The Medical School, University of Minnesota, Minneapolis, Minn. 276 pages; illustrated. The Blakiston Division, McGraw-Hill Book Co., Inc., New York, N. Y., 1955. Price $15.

An Outline of THE TREATMENT OF FRACTURES, by the Committee on Trauma. 5th edition. revised and amplified. 63 pages; illustrated. American College of Surgeons, Chicago, Ill., 1954.

THE YEAR BOOK OF THE EYE, EAR, NOSE AND THROAT (1954-1955 Year Book Series). The Eye, edited by *Derrick Vail*, M. D., D. Oph. (Oxon.), F. A. C. S., F. R. C. S. (Hon.), Professor and Director, Department of Ophthalmology, Northwestern University Medical School; Attending Ophthalmologist, Passavant Memorial Hospital; Past Attending Ophthalmologist, Cook County Hospital. The Ear, Nose and Throat, edited by *John R. Lindsay*, M. D., Professor of Otolaryngology, The University of Chicago, The School of Medicine. 461 pages; illustrated. The Year Book Publishers, Inc., Chicago, Ill., 1955. Price $6.

THE HUMAN MASTICATORY APPARATUS, An Introduction to Dental Anthropology, by *Meyer Klatsky*, D. D. S., Director, Dental Division, Medical Department of the Workmen's Circle, New York, N. Y., and *Robert L. Fisher*, D. D. S., Department of Pedodontics, School of Dental and Oral Surgery of the Faculty of Medicine, Columbia University, New York, N. Y.; Dental and Oral Surgery Staff for Orthodontics, the Mount Sinai Hospital, New York, N. Y. Foreword by *Wilton Marion Krogman*, Ph. B., A. M., Ph. D., Professor of Physical Anthropology, Graduate School of Medicine, University of Pennsylvania, Philadelphia, Pa. Introduction by *Leuman M. Waugh*, D. D. S., D. D. C., Formerly Professor of Dentistry and Director of the Department of Orthodontics, School of Dental and Oral Surgery, Columbia University, New York, N. Y. 246 pages; illustrated. Dental Items of Interest Publishing Co., Inc., Brooklyn, N. Y., 1953.

ANNALS OF THE NEW YORK ACADEMY OF SCIENCES, Volume 59, Art. 3, "The Relation of Immunology to Tissue Homotransplantation," by *J. M. Converse* and 34 others, edited by *Roy Waldo Miner*. Pages 277-466; illustrated. The New York Academy of Sciences, New York, N. Y., Jan. 24, 1955. Price $4.

U. S. ARMY IN WORLD WAR II. Special Studies. THE WOMEN'S ARMY CORPS, by *Mattie E. Treadwell.* Office of the Chief of Military History, Department of the Army, Washington, D. C., 1954. 841 pages; illustrated. U. S. Government Printing Office, Washington 25, D. C. Price $6.25 (Cloth).

ANNALS OF THE NEW YORK ACADEMY OF SCIENCES, Volume 59, Art. 4, "Ionizing Radiation and the Cell," by *L. F. Nims* and 22 others, edited by *Roy Waldo Miner.* Pages 467-664; illustrated. The New York Academy of Sciences, New York, N. Y., Feb. 3, 1955. Price $4.

THE DEVELOPMENT OF MEDICAL BIBLIOGRAPHY, by *Estelle Brodman,* Ph. D., Assistant Librarian for Reference Services, Armed Forces Medical Library, Washington, D. C. 250 pages; illustrated. Published by Medical Library Association, 1954. Price $5. Send orders to: Archives Curator, Medical & Chirurgical Faculty of State of Maryland, Baltimore 1, Md.

DENTISTRY IN PUBLIC HEALTH, edited by *Walter J. Pelton,* B. S., D. D. S., M. S. P. H., Dental Director, Chief, Division of Dental Resources, Bureau of Medical Services, United States Public Health Service, Washington, D. C.; *Jacob M. Wisan,* D. D. S., M. S. P. H., Chief, Dental Health Section, Department of Public Health, Philadelphia, Pa.; in collaboration with *John T. Fulton,* D. D. S., Dental Services Advisor, Division of Health Services, United States Children's Bureau, Washington, D. C.; *John W. Knutson,* D. D. S., Dr. P. H., Assistant Surgeon General, Chief Dental Officer, United States Public Health Service, Washington, D. C.; Instructor in Dental Public Health, Georgetown University School of Dentistry; and *Albert L. Russell,* D. D. S., M. P. H., Dental Officer, Chief, Epidemiology and Biometry Branch, National Institute of Dental Research, United States Public Health Service, Bethesda, Md. 2d edition, completely revised and rewritten. 282 pages; illustrated. W. B. Saunders Co., Philadelphia, Pa., 1955. Price $6.50.

THE YEAR BOOK OF UROLOGY (1954-1955 Year Book Series), edited by *William Wallace Scott,* M. D., Ph. D., Director, James Buchanan Brady Urological Institute, The Johns Hopkins Hospital; Urologist-in-Charge, The Johns Hopkins Hospital; Professor of Urology, The Johns Hopkins University School of Medicine. 372 pages; illustrated. The Year Book Publishers, Inc., Chicago, Ill., 1955. Price $6.

LABORATORY MANUAL OF BIOCHEMISTRY, by *Benjamin Harrow, Ernest Borek, Abraham Mazur, Gilbert C. H. Stone,* and *Harry Wagreich,* Chemistry Department, City College of New York. 4th edition. 164 pages; illustrated. W. B. Saunders Co., Philadelphia, Pa., 1955. Price $3.

THE VERTEBRATE BODY, by *Alfred Sherwood Romer,* Alexander Agassiz Professor of Zoology, and Director, Museum of Comparative Zoology, Harvard University. 644 pages; illustrated. 2d edition. W. B. Saunders Co., Philadelphia, Pa., 1955. Price $7.

A TEXTBOOK OF PHYSIOLOGY, edited by *John F. Fulton,* M. D., Sterling Professor of the History of Medicine, Yale University School of Medicine, with the collaboration of 12 contributors. 17th edition. 1,275 pages; illustrated. W. B. Saunders Co., Philadelphia, Pa., 1955. Price $13.50.

Christopher's MINOR SURGERY, edited by *Alton Ochsner,* M. D., F. A. C. S., William Henderson Professor of Surgery and Chairman of the Department of Surgery, Tulane University of Louisiana School of Medicine; and *Michael E. DeBakey,* M. D., F. A. C. S., Professor of Surgery and Chairman of the Department of Surgery, Baylor University College of Medicine. 7th edition. 547 pages; illustrated. W. B. Saunders Co., Philadelphia, Pa., 1955. Price $9.

CURRENT THERAPY, 1955, Latest Approved Methods of Treatment for the Practicing Physician, edited by *Howard F. Conn,* M. D., with 12 consulting editors. 692 pages. W. B. Saunders Co., Philadelphia, Pa., 1955. Price $11.

INTRODUCTION TO RECREATION EDUCATION, by *John H. Jenny,* Ed. D., Associate Professor and Co-ordinator of the Recreation Curricula, Temple University, Philadelphia, Pa. 310 pages; illustrated. W. B. Saunders Co., Philadelphia, Pa., 1955.

A COMPREHENSIVE REVIEW OF DENTISTRY, For Use in Preparing for State Board Licensing Examinations, edited by *Vincent R. Trapozzano,* D. D. S., F. A. D. P., Formerly Professor of Prosthetic Dentistry, Head of the Prosthetic Department and Director of Postgraduate Division, Thomas W. Evans Museum and Dental Institute, the School of Dentistry, University of Pennsylvania; Professor of Prosthetic Dentistry, Graduate School of Medicine, University of Pennsylvania; with the collaboration of 24 contributors. 2d edition. 665 pages. W. B. Saunders Co., Philadelphia, Pa., 1955.

THE JOINTS OF THE EXTREMITIES, A Radiographic Study, Notes on Nonroutine Methods, Nonroutine Ideas, and Less-Common Pathology, by *Raymond W. Lewis,* M. D., Formerly Director, Department of Radiology, Consultant in Roentgenology, The Hospital for Special Surgery, New York, N. Y. 108 pages; illustrated. Charles C Thomas, Publisher, Springfield, Ill., 1955. Price $8.50.

NEUROLOGY, Volumes I, II, and III, by *S. A. Kinnier Wilson,* M. A., M. D., D. Sc. (Edin.), F. R. C. P., Formerly Physician, National Hospital, Queen Square; Senior Neurologist, King's College Hospital; Consulting Neurologist, Metropolitan Asylums Board (L. C. C.); Officer de L'Instruction Publique, R. F.; Honorary Fellow, Royal Academy of Medicine, Turin; Honorary Member, Royal Academy of Medicine, Belgium, National Academy of Medicine, Rio de Janeiro, Neurological Societies of Italy, Poland, Denmark, Holland, Brazil, Paris, Vienna, New York, and Philadelphia, the Japanese Association of Psychiatry and Neurology, the Society of German Neurologists, the Medical Society of Copenhagen, and the American Neurological Association; Corresponding Member, Neurological Society of Warsaw. Edited by *A. Ninian Bruce,* F. R. C. P. (Edin.), D. Sc. (Edin.), M. D., F. R. S. (Edin.), Lt. Col. R. A. M. C., Consulting Physician, Bangour Mental Hospital and St. Andrew's Hospital, Hawick; Consulting Neurologist, Jordanburn Nerve Hospital, Edinburgh; Lecturer in Neurology, University of Edinburgh; Member, Association of British Neurologists; Honorary Member, American Psychiatric Association; Membre Correspondant Étranger, Société de Neurologie de Paris; Membre Associé Étranger, Société Médico-Psychologique, Paris. 2d edition. 2,060 pages; 279 illustrations. The Williams and Wilkins Co., Baltimore, Md., 1955. Price $37.50 per set of three volumes.

ANTIMICROBIAL THERAPY IN MEDICAL PRACTICE, by *Harrison F. Flippin,* M. D., F. A. C. P., Associate Professor of Clinical Microbiology, The Graduate School of Medicine, The University of Pennsylvania; Visiting Physician, Philadelphia General Hospital (Blockley Division); Chief, Section of Infectious Diseases, Department of Medicine, The School of Medicine, The University of Pennsylvania; and *George M. Eisenberg,* D. Sc., Associate in Medicine, The Graduate School of Medicine, The University of Pennsylvania; Chief, Division of Bacteriology and Immunology, Department of Laboratories, Philadelphia General Hospital (Blockley Division), Philadelphia, Pa. 304 pages; 11 tables and therapeutic index. F. A. Davis Co., Philadelphia, Pa., 1955. Price $5.

ANALYTICAL CYTOLOGY, Methods for Studying Cellular Form and Function, edited by *Robert C. Mellors,* M. D., Ph. D., Division of Experimental Pathology, Sloan-Kettering Institute for Cancer Research and Pathology Laboratories, Memorial Center for Cancer and Allied Diseases, and Graduate School of Medical Sciences, Cornell University Medical College; foreword by *Francis O. Schmitt,* Ph. D. 522 pages; illustrated. The Blakiston Division, McGraw-Hill Book Co., Inc., New York, N. Y., 1955. Price $15.

BRITISH OBSTETRIC AND GYNECOLOGICAL PRACTICE (two volumes). OBSTETRICS, edited by Sir *Eardley H. Holland,* M. D. (Lond.), F. R. C. P., F. R. C. S., F. R. C. O. G., Hon. M. D. (Dublin); Hon. LL. D. (Birmingham); Hon. LL. D. (Leeds); Hon. F. R. C. S. (Edin.); Consulting Obstetric and Gynecological Surgeon, London Hospital; Late President, Royal College of Obstetricians and Gynecologists; President XIIth British Congress (1952); Hon. Fellow American Gynecological Society; Corresponding Member, French and German Gynecological Societies; with *38 contributors.* 1,166 pages; 395 illustrations. GYNECOLOGY, edited by *Aleck Bourne,* M. A., M. B., B. Ch. (Cantab.), F. R. C. S., F. R. C. O. G.; Consulting Gynecologist, St. Mary's Hospital, London; Consulting Obstetric Surgeon, Queen Charlotte's Hospital; Consulting Surgeon, Samaritan Hospital for Women, London; with *21 contributors.* 841 pages; 363 illustrations. F. A. Davis Co., Philadelphia, Pa., 1955. Price $29.50 per set of two volumes.

FORCEPS DELIVERIES, by *Edward H. Dennen,* M. D., F. A. C. S., Professor of Obstetrics and Gynecology, Director of Department and Attending Obstetrician, New York Polyclinic Medical School and Hospital; Associate Professor of Clinical Obstetrics and Gynecology, Cornell Medical College. First volume of a Series of Monographs on Obstetrics and Gynecology. Edited by *Claude E. Heaton,* M. D., Associate Professor of Obstetrics and Gynecology, New York University College of Medicine. 225 pages; 90 illustrations. F. A. Davis Co., Philadelphia, Pa., 1955. Price $6.50.

SELECTED PAPERS OF DR. FRANK N. WILSON, edited by Dr. *Franklin D. Johnston* and Dr. *Eugene Lepeschkin,* Heart Station, University Hospital, Ann Arbor, Mich. 1,135 pages; illustrated. J. W. Edwards, Publisher, Inc., Ann Arbor, Mich., 1954. Price $8.

MEDICAL STUDENTS AND MEDICAL SCIENCES, Some Problems of Education in Britain and the United States, by *D. C. Sinclair,* M. A., M. D., University Demonstrator in Human Anatomy, Oxford University; Lecturer in Anatomy, Pembroke College, Oxford. Oxford Medical Publications. 154 pages. Geoffrey Cumberlege, Oxford University Press, New York, N. Y., 1955. Price $5.75.

THE SUBNORMAL MIND, by Sir *Cyril Burt,* D. Sc., Hon. Litt. D., Hon. LL. D., Fellow of the British Academy, Emeritus Professor of Psychology, University of London, Honorary Fellow, Jesus College, Oxford. 3d edition. University of London, Heath Clark Lectures, 1933, delivered at The London School of Hygiene and Tropical Medicine. 391 pages. Oxford University Press, New York, N. Y., 1955. Price $5.

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